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Arctic Squadron quitting the Nore

April 1852.

14

THE

LAST OF THE ARCTIC VOYAGES;

BEING A NARRATIVE OF

THE EXPEDITION IN H.M.S. ASSISTANCE,

UNDER THE COMMAND OF

CAPTAIN SIR EDWARD BELCHER, C.B.,

&c.

IN SEARCH OF SIR JOHN FRANKLIN, DURING THE YEARS 1852-53-54.

2. b. 14

WITH

NOTES ON THE NATURAL HISTORY,

BY

SIR JOHN RICHARDSON, PROFESSOR OWEN, THOMAS BELL, J. W. SALTER, AND LOVELL REEVE.

IN TWO VOLUMES.

VOL. I.

85593

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1855.

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JOHN EDWARD TAYLOR, PRINTER,
LITTLE QUEEN STREET, LINCOLN'S INN FIELDS.

TO

REAR-ADMIRAL SIR FRANCIS BEAUFORT, K.C.B.,

F.R.S., F.G.S., F.R.A.S., ETC.,

THE HYDROGRAPHER OF THE ADMIRALTY,

UNDER WHOSE

GENEROUS SYMPATHY AND UNFLINCHING PATRIOTISM

THE VARIOUS EXPEDITIONS ENGAGED IN SEARCH OF

SIR JOHN FRANKLIN AND HIS GALLANT ASSOCIATES

HAVE BEEN CHIEFLY PLANNED AND EXECUTED,

This Narrative

OF

THE LAST OF THE ARCTIC VOYAGES

IS (BY PERMISSION)

WITH FEELINGS OF RESPECT AND GRATITUDE

DEDICATED

BY HIS VERY FAITHFUL FRIEND AND ADMIRER,

THE AUTHOR.

PREFACE.

THE details of Arctic Exploration, including wintering and sledge-travelling, having been so fully described by preceding voyagers, my object in presenting to the public the following narrative has been rather to place on record an account of the Expedition of H.M.S. Assistance, as being 'The Last of the Arctic Voyages' undertaken by this country in search of the lost Franklin, and as being that which penetrated up Wellington Channel to the extreme limits of navigation. The Title of the work may appear open to objection, but taking into account the dates of original Orders, and those in force in April, 1854, it will be apparent that the final command of the British Naval Expedition within the Arctic Seas was vested in me. That I conceived aright the intent of my Instructions, the probabilities attending the safety of other branches not acting immediately under my control, has been sufficiently verified by the safe return of all engaged, to this country.

Recent accounts affording the satisfactory intelligence

of the release of the American Expedition adds another proof of the uncertainty of the navigation even of the mouth of Lancaster Sound, which was found late in August to be completely barred by ice; and consequently Captain Hartstein was unable to place the monument to Captain Franklin on Beechey Island. With such facts before us, we cannot but rejoice that no vessels and crews were left, to distract the feelings of relatives nor uselessly to exhaust the revenues of the country.

The system of Arctic travel by sledges over vast distances, and the powers of men in carrying out labours under which the quadruped, taking man- against horse-power, would succumb, present a new feature as compared with the labours of the lamented Parry and his associates. True it is that the qualities of the professed seaman find but small scope in this narrative; but the exertions of those who did venture upon travel offers matter for reflection on the powers of men in every stage of action where their services may be required, be the enemy frost, fire, patient endurance of monotonous labour, or battle.

The value of the seaman—I mean the disciplined man—in carrying out the service here recorded, entailing questions even of existence if they faltered or failed in strength, has not, I fear, been sufficiently estimated by those who merely read of the exploits of the sledge travellers; nor can my pen do justice to their labours, to the passive endurance, the high discipline, which characterized their performance, only to be sustained on the

homeward route under the conviction that failure would entail the most cruel death.

Unwittingly we allot the credit to the officers; but, as one of those travellers who entered most fully into the feelings of the men, their habits and prejudices, and free from the killing labour of the drag-rope, my duty compelling me to stop labour when I perhaps felt quite able to endure more, I do conscientiously assert that the greatest credit is due to the fine moral crew which it was my good fortune to command, and to return to this country without even the threat of the lash. What has been their reward? The excitement of war possibly has blinded their countrymen to their deserts; or Arctic service, now that search has terminated, is eclipsed by labour in the trenches.

Thus much then for Arctic service. Next will be found matters connected with science, which, although treated of in the early history which broke ground through Lancaster Sound in 1818–19–20, still left us in doubt as to the general laws which prevailed over a series of years,—indeed did not afford any decided data on which argument could be founded, as to the mean temperatures of months or seasons, nor of the ratio in which the freezing of the winter ice covering those seas proceeds. Nor do I pretend to have determined these questions; but merely in producing possibly the most perfect collection of such records, and, as an observer on the spot, furnishing such ideas as forced themselves on my mind, afford to those more deeply versed in meteoro-

logical questions data on which they may build more reliable theories than prevailed previous to this Expedition.

Another question, and one not unattended by opportunity for cavil, may be found in the measures which were adopted by me for the preservation of the health of my crew, as well as the comfort between decks; but on all these matters I think that figures and facts must drown all cavil, and that in any future fittings the system advocated and proved by me must have force in a sanitary point of view. The deaths which occurred were clearly those which might have been avoided by a more strict attention to the selection of the individuals; none could be classed as the result of Arctic travel or exposure.

Other matters, embracing periodic returns of gales, bad weather, and unaccountable disruption of the ice after winter had apparently set its seal on the season, offer subjects for interesting discussion. The effect of contrary tides, meeting as they do in this country about Dover, point out unmistakably the reason that Wellington Channel remains sealed at the very moment that nature appears to promise its free navigation.

One only question remains in mystery, that is the final report as to the fate of the gallant Sir John Franklin and his companions. I have treated that with the same confidence which induced me to assert, in August, 1852, "that he never passed northerly or westerly of Beechey Island;" and, until positive intelligence to the contrary

reaches us, must yet believe that his parties divided as I have imagined.

Although I have not in these pages asserted any claim to the participation in the solution of the Northern Passage to the Pacific, still any geographer will readily understand that the continuous frozen sea, traced by the officers under my command, in 1853, proves a water communication through Wellington Channel, round Parry Islands, to the position attained by Captain M'Clure; and that in 1854 our sledge-parties had penetrated to the southern extreme of Prince of Wales Strait, perfecting the labours of Dease and Simpson.

I am indebted to Sir John Richardson, Professor Owen, Professor Bell, Mr. Salter, Mr. Glaisher, and Mr. Reeve, for their valuable contributions to the Natural History portion of the second volume. Each statement offered is supported by documents, accessible to any who may be desirous of further evidence.

To those who have seconded and supported me in my duties, whether named or otherwise, my thanks are due; and I thus express myself because I know it will be acceptable to those who honestly performed their duty: "Palmam qui meruit ferat."

EDWARD BELCHER.

London, November 1, 1855.

CONTENTS

OF VOL. I.

PRELIMINARY.

PAGE

Admiralty Instructions.—List of Officers.—The 'North Star.'—Boat Department.—Supplies.—Instruments.—Azimuth Tables.—Library and Printing Press.—Ships Undocked.—Leave Woolwich.—Visited by the Admiralty.—Quit the Nore 1

CHAPTER I.

At Sea.—Reach the Orkneys.—Stromness.—Scarcity of Stock.—Departure of the 'Basilisk' and 'Desperate.'—Enter Baffin's Bay.—Whalefish Islands.—Reception by Esquimaux.—Lievely.—Disasters.—Moored at Lievely.—Survey of the Port.—Quit Lievely.—Search for Coal.—Quit the Waigat 25

CHAPTER II.

Anchor at Upernavik.—The Squadron adrift.—Dangers numerous.—Prospects of the Voyage.—Browne Islands.—Preparation for Flitting.—The 'Resolute' nipped.—Docking.—Blasting Ice.—Wreck of the 'Regalia.'—Meet a Whaler.—Irregularities of the Crew.—Melville Bay.—Floe Law.—Capture a Bear.—Cape York 42

CHAPTER III.

Native Dogs.—Red Snow.—Cape Dudley Digges.—Game.—Cape Warrender.—Beechey Island.—Rejoined by Captain Kellett.—Cape Riley.—Find Pieces of Whale.—Parting Ceremonies.—Wellington Channel.—Queen's Channel.—Count Percy.—Winter Quarters 65

CHAPTER IV.

PAGE

Frozen in.—Sledge Travelling.—Walrus Shot.—Habits of the Walrus.—Village Point.—Esquimaux Hut.—Deceived by Mirage.—Tent Equipage.—The Sentinel.—Ice Accumulations.—An Intruder.—Exmouth Island.—Rejoining of the Party.—Nip and Piling Ice.—Quit Exmouth Island.—North Cornwall . 90

CHAPTER V.

Retreat.—Land's End of North Cornwall.—Pell Point.—Table Island.—Chased by a Walrus.—Sledge breaks in.—Danger from the Ice.—Observatory erected.—Second Autumnal Expedition.—Traces of Gold.—Gale and Disruption of Ice.—Oomiak constructed.—Walrus food.—The 'Eider-duck.'—Gain the Land-ice.—Reach Point Repose.—Return to the Ship . . . 113

CHAPTER VI.

The 'Assistance.'—Winter Fittings.—Moisture between Decks.—Meteorological Investigations.—Tide Gauge.—Anatomical Shrimps.—Washhouse.—Thoughts on Arctic Fittings.—Terraced Levels.—Effects of Tidal Action.—Tidal Fissures.—Experiments on Ice.—Last View of the Sun.—Her Majesty's Arctic Theatre.—A Gale.—The Observatory.—A Snow-storm 137

CHAPTER VII.

Transit Telescope.—Extremes of Cold.—Effects of the Gale.—Remarks on Equipment.—Sensations of Cold.—Parasclena.—Schools Established.—Society of Loyal Arctic Engineers.—Deflections of the Magnetometer.—Experiments on Freezing.—Ice Crystals.—The Aurora 159

CHAPTER VIII.

Short Days.—Minimum Temperatures.—Warmth of Vessels.—A She-Bear.—Preparations for Travel.—Theatricals.—Shortest Day.—Christmas Ode.—Christmas Fare.—Depth of Winter.—The New Year.—Comparison of Thermometers.—Freezing Mercury.—Range of Extreme Cold.—Freezing Ale.—Alcohol at a low Temperature 181

CHAPTER IX.

PAGE

Rise of Temperature.—A Bear shot.—Termination of Darkness.—Re-appearance of the Sun.—Death of a Marine.—Cold Period of March.—Table of Temperatures.—A She-Bear and her Cubs.—Sledges inspected.—Feet Wrappers.—Departure of the Sledges.—Beacons.—Cairns.—Parhelia.—Inland Excursion.—Wavy Ice.—Cooking Apparatus.—Lamps.—Return of Depôt Division 211

CHAPTER X.

The Cairn.—Anticipations.—South-west Expedition.—Tidal Motions.—Return of Mr. Loney.—Dog Killed.—Letters from Pullen.—North-east Expedition.—Tent Arrangements.—A Cold Bath.—The First Depôt.—A Wolf.—Princess Royal Island.—Tidal Rents.—Snow Blindness.—Mount Parker.—A Whale.—Hamilton Depôt 240

CHAPTER XI.

Inconvenient elevation.—Cape Disraeli.—Imbedded Whale.—Departure of Mr. Allard.—Determination of speed.—Strait discovered.—Progress arrested by the Pack.—Snow Crystals.—Discover open water.—Overland march.—Progress barred.—Fossil Station.—Deep Soundings.—Pack Ice.—A hollow Cairn.—Cape Disappointment.—Wellington Channel.—Apparent Graves.—Pitch Mount.—Bears 264

CHAPTER XII.

Hamilton Depôt.—Mount Parker.—Patches of Water.—Musk-oxen.—Dr. Lyall and Mr. Allard rejoin.—Preparations for search Northwards.—Lost Dog.—Freaks of Refraction.—Western Island.—Effect of Sun's Heat.—Buckingham Island.—Seal-holes.—Bear-hunt.—Recovery of Sledge.—Watercourses.—Rounded Pebbles.—Surface Disturbances.—Cape Ogle.—Water-fowl.—Lemmings.—Star Bluff.—Return to the Ship . 297

CHAPTER XIII.

Open Water.—Despatch from Richards.—Notice left by M'Clure.—Stores covered with Snow.—Brewing.—Mustard and Cress.

PAGE

—Return of Richards.—Movements of Western Division.—Game killed.—Canal completed.—Cairn on Barrow Island.—Osborn rejoins.—Mount Acland.—Assistance Spit.—Visit of Pullen.—Port Refuge 329

CHAPTER XIV.

First symptom of Winter.—Alarming Discovery.—Suspicions awakened.—Escape from a Nip.—Recent fragment of a Ship.—Drift-wood.—Party for Beechey Island.—Despatch of Lieutenant Osborn.—Want of Steam-power.—Unsafe position.—Aid sent to Lieutenant Osborn.—Inland Lakes.—Fishing.—A Spar found.—Trunk of a Tree.—Disturbance of the Ice.—Fragments of a Ship 367

GLOSSARY OF ARCTIC TERMS.

Anchor, Ice, a round bar of iron twice bent like a pot-hook: the end to which the rope is bent is cut short off and bent suddenly back; the other is tapered after the bend, which is at an angle of 60° to the body or shank. A hole being cut in the ice by an axe fashioned for this purpose, similar to half a pickaxe, this hook serves to secure the vessel to the ice.

Axe, Ice, as above described.

Barber is properly the condensation of vapour rising from ice, the result of freezing; also breath condensed.

Bay Ice, that which freezes continuously on the surface, and derives its name probably from its forming more rapidly in bays, or spots sheltered from the breeze.

Beset, the approach of floating ice on all sides, leaving no opening for advance or retreat, and leaving the vessel unmanageable.

Bight, any hollow, bay of ice, land, etc.

Berg. See *Iceberg*.

Blasting: this operation is generally performed by cutting a hole through the ice of sufficient bore to admit of a canister of six inches diameter, containing powder, being passed through; a flexible fuse of sufficient length to burn three minutes being lighted, affords time to permit the men to recede from danger.

Bore: to *bore* through the pack; the forcing a vessel through loose, movable pack under canvas or steam, with the chances of taking advantage of cracks or openings.

Brash, comminuted ice.

Buckle, bending or arching of the ice upwards, preceding a nip.

Calf, a huge splinter splitting off from a berg, or the berg detaching itself from the main mass on which it formed; sometimes misrepresented by a shelf, or loose piece, which is driven from under the floe, and rises suddenly to the surface, damaging ship or boat.

Clear Water, no ice obstructing navigation.

Crow's-nest, a watch-box constructed at the topgallantmast-head, to protect the man looking out for whales or ice from the inclemency of the weather; sitting comfortably ensconced in the Crow's-nest, the Ice-master pilots the vessel through the best lanes or open places in the ice.

Curl, the bending over or disruption of the ice at the point of resistance, causing it to pile slab over slab, or throw over the comminuted bits.

Cutting, out or in, performed by sawing canals, out of which the ice is lifted above, or passed beneath, the floe, enabling the ship to advance towards open water.

Dock: this is simply an opening cut out of the floe into which the ship is warped for security against threatened pressure, from extensive floes coming into opposition. It is, as reason will point out, at right angles to any extensive crack or open water. A "natural dock" is frequently afforded by some deep gap, out of which, at some of these convulsions, the ice has floated. Any extensive floe falling across the mouth of such an opening would naturally close it, expending its force on the projecting irregularities.

Field Ice, any great extent of smooth ice, the result of water frozen in a quiescent condition, and of equal thickness throughout.

Floe may be any portion of a field of ice disconnected, as floe pieces. *Bay floe*, or *Land floe*, would be that attached to the land. *Bay floe* is also considered as bay ice of the last season, now become floe of the present.

Hummocks, lumps of ice, generally bits of pack frozen together, and snow covered during winter.

Ice. See *Bay Ice*, *Field Ice*, *Floe*, *Pack*, *Pancake Ice*.

Ice Anchor. See *Anchor*.

Ice Axe. See *Axe*.

Iceberg: this term is frequently misapplied; properly it belongs only to huge mountains of ice entirely of freshwater formation, which

by constant increase from the summer thaws become at length too heavy to be supported by cohesion to the land mass, and then *calve*, or split off from the glacier. They are termed by the Greenland authorities (*vide* Graah, p. 24) Ice Blinks.

Ice Blink: this term, as understood by our Greenland whalers, does not bear the same meaning as that given by the Danes. With us "*blink*" indicates the reflection in the atmosphere over the object. The term in the English dictionary defines it, "to glisten, show white," etc. If the atmosphere immediately over the object be charged with vapour, its image may be perfectly reflected or represented, or, when very distant, a whitish auroral divergence of rays constitutes the blink, seen long before the object itself can be distinguished; it is comparative with our "loom of land."

Ice Chisels, large socket chisels, into which poles are inserted, used to cut holes in the ice.

Ice Hooks, or *Claws*, similar to timber claws; a double hook, with rectangular pointed claws to hold on by abrupt ice or cracks.

Ice Master, or *Ice Quartermaster*, a whaling captain or mate, selected for his experience in the whale-fishery, to afford advice to the officers commanding. He usually pilots the vessel either from the Crow's-nest, or *spike* plank, when amongst the ice.

Ice Plank, or *Spike Plank*, a platform projecting across the vessel seven or eight feet above deck and beyond the sides, to enable the pilot to run from side to side, to pilot the vessel clear of ice.

Ice Saws, huge saws made from half-inch plates of iron, and varying in length from ten to twenty-four feet.

Ice Sludge, smaller comminuted ice, or bay ice broken up by the wind.

Lane, any open cracks, or separations of floe, offering navigation.
Lead, similar to *Lane*.

Nip: when two floes are in motion and approaching each other, the result generally is a grinding action in passing or until their impetus is expended, which destroys the opposed surfaces, raising long ridges of curled or thrown-up ice. When a vessel unhappily has not time to dock, or becomes entrapped between the opposed bodies, she becomes nipped, or, in many cases, the floe, which is weakest, rises over and overwhelms her entirely,—to use the whaler's term, "walks clean over her."

Old Ice, that of previous seasons.

Pack is that collection of broken floe which, huddled together under pressure, is constantly varying in its position; it cannot be dealt with nor can it be travelled over until cemented together by freezing; it has no limit,—it may cover a mile or hundreds of miles, as in Baffin's Bay. Simply it is any loose ice packed into a space before vacant.

Pancake Ice, that which results from snow falling into the sea without thawing, and by the action of the waves driven into pancake forms, which offer no solid obstruction, but nevertheless hamper a vessel more than small ice.

Reeving, following up various labyrinthine or angular channels until the vessel reaches open water; as, "reeve the pack."

Run, when the ice is suddenly impelled by an unaccountable, fitful, rushing motion.

Sailing, loose ice relieved from pressure, which admits of picking a way through the weakest parts.

Shearing, or *Lapping:* this applies more peculiarly to young or thin ice with boats, one plate overlapping another where a boat has made an extensive crack. Where boats have been thus destroyed the crews have rarely escaped, the ice being too weak to bear, and the plates overlapping those attempting to swim.

Shelf, or *Tongue:* frequently, on the meeting of adverse floes, a smaller interposing floe-piece is forced under, and, cohering or freezing to that above, presents, below water, a tongue or shelf, which annoys the keel of a vessel, or, breaking off, comes up as a "calf" with great violence.

Sludge, comminuted ice.

Smoke, or *Vapour*, a peculiar kind of vapour, the natural result of the conversion of water into ice, which is constantly supposed to indicate lakes or open water in an unfrozen state.

Water Sky: this evidently is connected with smoke or vapour, and is the reflected colour of the blue sea in the atmosphere or vapour arising from the warmer sea; it generally exhibits a dark, dull, neutral tint, which is never seen to the eye, at least of an intelligent ice-master, unless *water* be under it. This is peculiarly the case in Melville Bay.

Young Ice, that immediately formed, or of the present season.

LIST

OF

CHARTS, PLATES, AND WOOD ENGRAVINGS.

Charts.

1.	Discoveries in the Arctic Sea, 1819–54	Vol. I.	In pocket.
2.	Plan of the Port of Lievely	„	*ib.*
3.	Plan of Northumberland Sound	„	Page 90
4.	Plan of the Fossiliferous Oval	Vol. II.	391

Plates.

1.	Arctic Squadron quitting the Nore	Vol. I.,	Frontispiece.
2.	Extraordinary Dyke, Point Hogarth	„	Page 85
3.	Novel Ferry	„	„ 93
4.	Exmouth Island	„	„ 105
5.	The 'Hamilton' under canvas	„	„ 119
6.	Duck-shooting in Oomiak sledge	„	„ 133
7.	Snow wreath, Northumberland Sound	„	„ 155
8.	Parasclena	„	„ 169
9.	Alarum Tide-gauge	„	„ 141
10.	Departure of Sledges	„	„ 243
11.	Entrance of Cardigan Strait	„	„ 271
12.	Blown out of Winter Quarters	Vol. II.,	Frontispiece.
13.	Crystal Palace Winter Quarters	„	Page 67
14.	Upper Deck Fittings	„	„ 291
15.	Cenotaph at Beechey Island	„	„ 231
16.	Direction Signals	Vol. I.	„ 350
17.	Thermometer buried in snow	Vol. II.	„ 173
18.	Plan of Oomiak sledge	Vol. I.	„ 131

19 to 22. Illustrations of Snow Crystals	Vol. II.	Appendix.
23 to 30. Illustrations of Fish	„	„
31. Bones of Ichthyosaurus	„	„
32 and 33. Illustrations of Shells	„	„
34 and 35. Illustrations of Crustacea	„	„
36. Illustrations of Carboniferous Fossils	„	„

Wood Engravings.

Esquimaux huts	Vol. I.	Page 95
Wooden flaying-knife	„	„ 97
Ice cracks	„	„ 109
Effects of tidal motion	„	„ 149
Aneroid incrusted with snow	„	„ 157
Effects of gale on snow pillars	„	„ 162
Hard-lined clouds	„	„ 169
Mercurio-spirit thermometer	„	„ 207
Thermometer vane	„	„ 212
Feet-wrappers	„	„ 221
Thermometer block	„	„ 223
Parhelia	„	„ 227
Rig of sledges	„	„ 229
Upsetting of sledges and old ice	„	„ 231
Princess Royal Island	„	„ 258
Hamilton Depôt	„	„ 263
Fossil station	„	„ 272
Hollow cairn	„	„ 280
Graves	„	„ 285
Peculiar Cairn	„	„ 291
Freaks of Refraction	„	„ 303
Star Bluff, Cape Ekins	„	„ 325
Driven aground—Run of ice	Vol. II.	„ 57
Coast-line fissures	„	„ 73
Prismatic Cross	„	„ 92

GREENLAND

PLAN
of the
PORT of LIEVELY

BY CAPT.ᴺ SIR EDW.ᴰ BELCHER.

Flagstaff { Lat. 69° 13′ 56″ N.
Long. 53 42 00 W.

SOUNDINGS IN FATHOMS.

Englishmans Bay

Cod Bay

Watsons Bay

Mt Brougham

Assistance Pt

Whaling Range

Flat Islands nearly dried at low water

Lock out Hill

Hunky Pt

False Bay

Back Bay

Lacey I.

High Land very little below Lock out Hill

Red Banner

S.W Headland

Variation 73° W.

SCALE

0 1 2 3 4 5 6 7 8 9 10 Cables
1 Nautic Mile

London, Published by Lovell Reeve, 5 Henrietta Street, Covent Garden.

Engraved by J. & C. Walker

THE

LAST OF THE ARCTIC VOYAGES,

UNDER THE COMMAND OF

CAPTAIN SIR EDWARD BELCHER, C.B.

PRELIMINARY.

Admiralty Instructions.—List of Officers.—The 'North Star.'—Boat Department.—Supplies.—Instruments.—Azimuth Tables.—Library and Printing Press.—Ships Undocked.—Leave Woolwich.—Visited by the Admiralty.—Quit the Nore.

HER Majesty's Government having deemed it necessary to prosecute the further search for the 'Erebus' and 'Terror,' which left England in the month of May, 1845, as well as for any traces of Sir John Franklin or his followers, my Lords Commissioners of the Admiralty were pleased to entrust me with the command of the Expedition, the entire objects of which will be nearly apparent from the following Instructions :—

ORDERS.—No. I.

By the Commissioners for executing the Office of Lord High Admiral of the United Kingdom of Great Britain and Ireland, etc. etc.

1. Having appointed you to the command of the Expedition (to consist of the ships named in the margin*) preparing for the further

* Assistance, Resolute, Pioneer, Intrepid, North Star.

search for Sir John Franklin, you are, whenever such ships shall be in all respects ready to put to sea and proceeding down Channel or "north about," make the best of your way to Barrow Strait, calling at Disco (if in your way) for such replenishments as the place affords, and for a supply of dogs for sledging purposes.

2. We have entrusted you with this command in the full persuasion of your thorough acquaintance with its obligations, and of your judgment and ability to meet them.

3. We do not therefore consider it necessary to encumber you with minute instructions for your guidance at each step of your proceedings; but furnishing you with papers which point out the views of the Admiralty, as successive expeditions have been despatched from this country, and those also relative to the difficulties occurring to oppose those views, we leave it to you to decide as the case shall present itself.

4. We deem it right, however, that a certain course of proceedings should be pointed out to you; and adopting the recommendation of the Committee appointed in October, 1851, to inquire and report upon a previous expedition, the plan of future operations there proposed is to be considered as the basis of your proceedings. By that plan, Beechey Island is the point indicated as the basis of your operations, and you are to consider it as the grand rendezvous to which you are to push forward, there to establish the 'North Star' as a general depôt.

5. Arrived at this point, two great objects will engage your attention:—

1st. The endeavouring to pass up Wellington Channel with one sailing-vessel and one steamer.

2nd. The advance of a similar force towards Melville Island.

6. The object of the first of these expeditions will be, the endeavour to recover those traces of Sir John Franklin which ceased at Cape Bowden, to the north of Beechey Island; and to follow up such traces if they should be found. The object of the other expedition will be, to deposit, if possible, at Winter Harbour, Melville Island, or failing that, at Byam Martin Island, a supply of provisions, fuel, and clothing, for any parties that might reach such positions from Captain Collinson's or Commander M'Clure's ships.

7. As regards the first-named Expedition, and the possible contingency of coming upon Sir John Franklin's track, we cannot too strongly impress upon you the necessity of your establishing along your line of route *cachettes* of provisions sufficient to supply your crews and those of the missing ships, should any accident happen to your own

vessels, and render it necessary for you to return without them to the general rendezvous at Beechey Island; and you will be most careful along the line of such route, as well as in every other direction you may have to take, to avail yourself of every remarkable promontory, point of land, or other distinctive locality, to deposit exact notices of your condition and intended proceedings; and you are to give positive orders that these notices or records are to be deposited ten feet *true* north of the cairn or staff, and likewise beneath or in the cairn itself.

8. With regard to the Expedition to be despatched towards Melville Island, it is scarcely to be contemplated that, under the most favourable circumstances, more could be done in the first season than to reach that point; and the officer in charge of that service will of course have to take into account the having to winter in that quarter.

9. His earliest attention in that case, in the ensuing Spring, will be,—1st, the depositing such supplies at Melville Island as he can spare, or endeavouring to convey them thither by sledges if he should not reach the island with his ships; and 2nd, the detaching travelling parties in a westerly direction for the combined purpose of a search for traces of Sir John Franklin, and of depositing notices in conspicuous situations as to where the supplies are left, but being at the same time strictly enjoined to return to their ships before the usual period of the breaking up of the ice, in order that such ships may return to their rendezvous at Beechey Island, or otherwise prepare for quitting Lancaster Sound to return to England, according as the supplies on board of his ships and the length of time consumed in the above service shall require.

10. And here we think it necessary more particularly to call your attention to the instructions to be given by you to the officer charged with this branch of the Expedition; for whilst there is a possibility of your calculating on an early return of such officer from Melville Island in the summer of 1853, and of his being able to afford you support in any particular direction, it is, on the other hand, not improbable, that from a prolonged detention to the westward, it may be his bounden duty not to hazard a further stay in those seas, but to make the best of his way home; in which case he must endeavour to communicate with the rendezvous at Beechey Island before finally quitting Barrow's Strait, in order to obtain information of the other ships, and to deposit records of his proceedings.

11. He should therefore be made to understand the nature of the responsibility that devolves upon him, both as to the execution of his

orders in the first instance, and determining the point at which the power of compliance with those orders ceases.

12. It is of course possible that seasons such as were experienced by the Expedition in 1850-51 may again occur to prevent a passage by ships up Wellington Channel or to the west of Griffith Island; and, under such circumstances it will be for you to consider how far it might serve any useful purpose to undertake an examination by travelling parties from Baring Bay or Prince Alfred Bay, in the direction of Jones's Sound; in addition to those which it will be your duty to send out to the north and north-west, for traces of Sir John Franklin, in the direction of Queen's Channel.

13. Our instructions therefore are without reference to the possible circumstance of records still being found at Beechey Island or elsewhere (and for which it will be your duty to search), at a certain distance from the respective cairns, where it has been stated it was Sir John Franklin's custom to deposit them;* and if by such records it should prove that Sir John Franklin proceeded to the eastward out of Lancaster Sound, after he wintered at Beechey Island in 1845-46, you will still continue to push forward two of your ships towards Melville Island, as already directed by us, and with the other two you are to act as circumstances may render necessary, depending on the information which those records may convey. And adverting to the report of two ships having been seen on the ice in the North Atlantic in the spring of 1851, we think it expedient to draw your attention to this subject, that you may adopt such steps on your way from Baffin Bay, with reference to search and inquiry on the shores of Davis Straits, as you may consider most advisable under the circumstances above stated, and the information the records may convey.

14. You are aware of the deposit of stores and provisions at Port Leopold, and of the steam-launch left there by Sir James Ross: you are at liberty to employ that vessel in any way that her services may be made available; but with reference to the store of provisions at Port Leopold, and also those for one hundred men which were landed by Mr. Saunders on an island in Navy Board Inlet, it is our directions that such provisions and stores shall on no account be touched by any of the vessels under your orders, unless compelled to do so by absolute necessity.

* The piece of tin or copper, said by Adam Beck to have been dropped from a staff, should also be looked for.—*See Evidence before the Arctic Committee.*

15. We have furnished you with copies of these instructions, which you are to deliver to the Captain and Officers in command of vessels under your orders. And we deem it necessary that you should be directed to communicate freely and unreservedly with your second in command and the officers in charge of the other ships, on all points connected with the Expedition, keeping them acquainted with your views and intentions, that, in case of an accident happening to yourself, or a separation of the ships, these officers may be fully aware of the course of proceedings intended to be adopted by you; and when the ships are separated from you for the purpose of carrying out our orders, the same unreserved intercourse and communication is to be maintained between the officers in command of the respective ships.

16. You are no doubt aware of the 'Prince Albert,' private vessel, being engaged in a like search in the Arctic Seas; you are to afford that vessel every aid and assistance, in the event of falling in with her, but you are in no way to interfere with her orders or take her under your charge.

17. The various logs and private journals, with drawings, plans, etc., are to be sent to this office on the return of the Expedition. And you are to be careful that, from the date of your parting company with the ships sent to assist in towing you, your own letters to our Secretary, together with those of the officers addressing you, are duly numbered as well as dated; and you are invariably, should any opportunity offer, to leave letters for us at such places as Cape Warrender, Ponds Bay, etc., provided no delay be incurred thereby.

18. Your ships have been fully equipped for the service they are going upon, and it has been our desire that you should be provided with every means and resource that might be made available. We have an entire reliance on the best use and application of those means on your part, and we have equal confidence in the care to be exercised by you for those employed under your orders; but there is one object which in the exercise of that care will naturally engage your constant attention, and that is, the safe return of your party to this country.

19. We are sensible however that notwithstanding a wish to keep this part of your duty prominently in mind, yet that an ardent desire to accomplish the object of your mission, added to a generous sympathy for your missing countrymen, may prevail in some degree to carry you beyond the limits of a cautious prudence.

20. You are therefore distinctly to understand our directions to be, that the several ships under your orders shall each be on its way home,

and to the eastward of Barrow Strait, whenever their stock of provision shall have been reduced to twelve months' full allowance; and commending you, and those employed under you, to the providence of God, we trust that success may crown your efforts, and that you may be the means of affording succour to those of our countrymen whose absence we have so long deplored.

Given under our hands this 16th day of April, 1852,

NORTHUMBERLAND.
HYDE PARKER.
PHIPPS HORNBY.
THOS. HERBERT.
ALEX. MILNE.

To SIR EDWARD BELCHER, C.B.,
Captain of Her Majesty's Ship Assistance, at Greenhithe.

By Command of their Lordships,
W. A. B. HAMILTON.

No. II.

By the Commissioners for executing the Office of Lord High Admiral of the United Kingdom of Great Britain and Ireland, etc.

We have to inform you that we have despatched her Majesty's steam-vessel 'Phœnix,' under the command of Commander Inglefield, with the 'Breadalbane' transport, to Beechey Island, for the purpose of replenishing the ships under your command with stores and provisions, in case your supplies may have been so far reduced by the depôt formed at Melville Island and the various *cachettes* on the coast as to prevent you from continuing further search for Sir John Franklin during this season and the winter of 1853-54, if the information you may have gained determine you to continue such further search.

2. In communicating with you on the subject of your former orders and the service on which you are employed, we are aware how impossible it is for us to send out any definite instructions with reference to your future proceedings, when we are ignorant of the position in which you may now be placed, or whether any traces of Sir John Franklin's Expedition may have been found during last Autumn or the Spring of this year, and what steps you may have considered it most expedient to adopt. But if no trace of the missing ships have been found beyond the Wellington Channel, and if it should appear that by

the extended search you may have been enabled to make in that quarter, that the missing ships did not proceed in that direction, and if Captain Kellett should have reached Melville Island, as directed by his instructions, and his land expeditions should also have failed in finding any such trace, it does not appear to us that there is any other direction in which a prospect of their discovery can be expected. Every accessible part of the shores of the Polar Seas west of Lancaster Sound will have been visited without finding a trace of the missing ships, except their former station at Beechey Island in 1845 and 1846. In such a contingency as this, and if such should likewise be your opinion after mature consideration with the senior officers under your command, there appears no other course left but to abandon all further search.

3. But in case you should have found any trace of the Expedition, it will be your duty to follow up that trace. In doing this you must exercise extreme caution, so as not to lose your means of communication with Beechey Island; nor are you to incur any hopeless risk by proceeding beyond reasonable limits, for the safety of your own crews must be your first care. We place every confidence in your zeal and intelligence, and feel assured that you will act with sound judgment in whatever situation you may be placed; we therefore leave it to you either to abandon the Expedition altogether, if you are of opinion that no further steps can be practicably taken, or to send such of the ships to England as you may not require; transmitting by them to our Secretary not only a full account of all your proceedings, but charts of all your discoveries, and keeping us informed of your views and intentions, so that, if it should be necessary, every requisite aid may be given you in the Summer of 1854.

4. Before your final departure from the Polar Seas, should you think proper to adopt that course, there appears one very important subject which will require your serious consideration; and that is the present position of the ships under the command of Captain Collinson and Commander M'Clure, which entered the ice to the north-east of Point Barrow (Behring Straits), the latter in August, 1850, and the former in July, 1851. These officers with their respective crews may have been compelled by circumstances to abandon their ships. If such should be the case, they may probably attempt to reach Melville Island; and having had this in view when you left England, we directed in your instructions that a depôt of provisions and other stores should be formed at that island. From this position they will no doubt

endeavour to make their way to Beechey Island or Port Leopold. It will therefore be your duty, before returning to England, to be fully satisfied that a proper depôt of coals, provisions, etc. had been formed at Melville Island by Captain Kellett, and that clear information had also been left there that similar supplies would be found at Beechey Island.

5. This depôt on Beechey Island is to consist of a full store of coal, provisions, clothes, and other stores, and you will take care to have it most carefully secured against the depredations of bears or other animals; you are also to leave one of your ships there, with or without a crew, as you may deem most advisable, so that Captain Collinson or Commander M'Clure's parties may find every possible assistance which they may require, and have the means at their command of returning to England; but should you find it to be practicable to place the ship, or a depôt of stores, in a more advanced position, between Melville and Beechey Islands, it might be expedient to do so. This is a point on which you can form a better judgment than we can. Our most anxious wish is to establish the best possible arrangement with the view of giving succour and support to the crews of those ships, should they be compelled to seek refuge in the direction we have pointed out.

6. Having expressed these general views, which will require your careful consideration, we leave it to you to take such steps as you may consider most expedient for meeting the circumstances of the case.

7. On the arrival of the transport at Beechey Island, you are immediately to hasten her discharge, and despatch her to England with the least possible delay; and you are not to detain the 'Phœnix' longer than may be necessary, or to risk her being frozen in, but to send her also to England with intelligence of your proceedings, exchanging any of her men, and sending invalids, etc.

Given under our hands this 11th day of May, 1853,

(Signed) J. R. G. Graham.
Hyde Parker.
M. F. F. Berkeley.
R. S. Dundas.
Alex. Milne.

To Sir E. Belcher, C.B.,
Captain of Her Majesty's Ship Assistance,
Arctic Seas.

By Command of their Lordships,
(Signed) R. Osborne.

No. III.

Instructions to Captain Sir Edward Belcher, C.B., or the Senior Officer of Her Majesty's Ships at Beechey Island.

Admiralty, April 28, 1854.

SIR,

My Lords Commissioners of the Admiralty have directed Her Majesty's ships Phœnix and Talbot, under the orders of Captain Inglefield, to proceed with provisions and stores to Beechey Island, for the purpose of replenishing the ships and depôts under your orders; and I am commanded by their Lordships to acquaint you that on the return of the 'Phœnix' from Beechey Island last year, they had the satisfaction of hearing of the safe arrival of Her Majesty's ship Investigator, under the command of Captain M'Clure, at Banks Land, having completed the discovery of the North-West Passage, though unhappily, without discovering traces of Sir John Franklin, and that part of the crew had been enabled to reach Captain Kellett's station at Melville Island. By despatches which they received from Behring Straits they have information that in August, 1851, Captain Collinson, in Her Majesty's ship Enterprise passed the entrance of the Colville River; and their Lordships trust by the reports he may have obtained from the natives of Prince Albert's Land, as well as from the records deposited by Captain M'Clure on his passage along that shore, that he may also have been enabled to reach some harbour on Banks Land, from whence he has made known his position either to Captain M'Clure or Captain Kellett.

Their Lordships have desired me to direct your special attention to the measures they now require to be adopted for at once withdrawing, if possible, the whole of the force now employed in the search of Sir J. Franklin from the Polar Seas; for effecting this object they refrain from issuing any positive instructions how you are to act, or what steps you are to take, as they are aware you must be entirely guided by the position of the ships, and those varying circumstances which in that region must influence your operations; but their Lordships' view may be stated generally as follows:—

1. If the crews of the 'Enterprise' and 'Investigator' are at Banks Land, they must abandon their ships, and every endeavour should be made to get them to Beechey Island, that they may return to England. If this has already been effected, and Captain Kellett with his ships has returned from Melville Island, you are immediately to proceed to England with the whole of the ships and their crews, abandoning all

further search for the missing Expedition, unless any circumstances (on consultation with the senior officers of Her Majesty's ships) should induce you to believe that your remaining out another year would tend to clear up the fate of our missing countrymen. But if Captain Kellett has been unable to move from his position at Melville Island, it may be necessary to give orders to him to abandon the 'Resolute' and 'Intrepid,' and secure his retreat to Beechey Island; but as this cannot be accomplished this year, you need not detain any officers or men who may have already reached Beechey Island, but send them to England forthwith.

2. Should no tidings have been heard of Captain Collinson in her Majesty's ship Enterprise, it becomes absolutely necessary to provide for his safety. For this purpose the Melville Island depôt must be replenished with provisions and stores; and it will be necessary for a ship and steam-tender to remain there, also the 'North Star' or 'Talbot,' with a tender, at Beechey Island, and at those stations everything which can add to the health and comfort of the crews should be deposited; and having done this, it does not appear to their Lordships to be necessary that any of the other ships should remain another year in the Polar Sea, unless, as before stated, you consider further search to be prudent and necessary.

These are the views of their Lordships: their great object being to recall, with the least possible delay, the whole of the ships or crews named in the margin,* if it can be done; if not possible to do so, they leave it to your judgment and discretion to send home such of them as may not be required, and to adopt those measures which you consider most necessary to ensure the safety of Captain Collinson and his crew, and their speedy return to England. This, their Lordships are aware, must depend on the information you may have received from Melville Island, the position of the respective ships under your orders, the state of the depôts, etc.; all their Lordships can do is to confide in your judgment, and they authorize you to take such steps and give such orders, and to make such exchanges of officers and men, as you may deem necessary for carrying their wishes into effect.

They trust however Captain Collinson is safe; and if so, it will be a source of much satisfaction to them, if during the approaching Autumn the whole of your ships and crews shall arrive in England.

* Assistance, Pioneer, Resolute, Intrepid, Enterprise, Investigator, North Star, Phœnix, and Talbot.

On the return of any of the ships to England from Beechey Island, it is desirable that the coast to the southward of Ponds Bay, namely, from the River Clyde towards Cape Walsingham, should be examined; and you are therefore to endeavour, in your instruction to the ships proceeding to England, to meet this contingency.

In the event of your health rendering it necessary for you to return to England, and the necessity of a part of the squadron remaining out another winter, you are to make known to the officer whom you may appoint to succeed you in command, all your views and arrangements respecting further proceedings.

Although this country is now at war with Russia, you are clearly to understand that you are not to commit any hostile act whatever, the ships under your command having been fitted out for the sole purpose of aiding those engaged in scientific discoveries; and it being the established practice of all civilized nations te consider vessels so employed as exempt from the operations of war.

I am, Sir,

Your most humble servant,

R. OSBORNE.

I have used the expression "nearly apparent," but at the sixth paragraph of these first Instructions it will at once occur to my readers that my mission was not quite single. Independent of the leading feature of this search for Sir John Franklin, two others of Her Majesty's ships, under the command of Captain Collinson, C.B., and Commander M'Clure,—the 'Enterprise' and 'Investigator,'—were yet to occupy my attention, and that too of a nature not contemplated, but, to my perception, to increase in interest, as well as importance, with each succeeding season of my absence from this country; and unless recalled by intelligence of their safety, still demanding my presence in those regions until every security for their comfort and final relief was provided for by depôts of provisions, as well by leaving behind some

vessel of the squadron to await either their arrival or recall from England.

Other objects, not enumerated, but clearly understood by my previous employment, will find their customary notice, simply observing that, so far as science was concerned, this Expedition was not, when not otherwise engaged, to neglect its interests.

Fortunately, at the moment that I received my appointment, on the 10th of February, 1852, my old companions, Captain H. Kellett, C.B., and Commander Richards, volunteered to support me, the former taking command of the 'Resolute,' and the latter (third in command) of my own ship, the 'Assistance.' Commander M'Clintock, Mr. Loney and Mr. M'Dougall, Masters, had also served under me, the two latter in the 'Samarang.' The other officers were appointed, as having volunteered, and having served in the former Expedition, under my predecessor, Captain Austin.

It has been customary to annex the names of the officers engaged in such Expeditions, and I shall therefore follow the example, which is simply an extract from the official 'Navy List:'—

	Assistance.	Resolute.	North Star.
Captain . .	Sir E. Belcher, C.B.	H. Kellett, C.B.	
Commander	G. H. Richards.	F. L. M'Clintock†	W. J. J. Pullen.
Lieutenant.	Sherard Osborn*	G. F. Mecham	
	Walter W. May	B. C. T. Pim	
	J. P. Cheyne	R. V. Hamilton	
Master . .	J. F. Loney .	G. F. M'Dougall	T. C. Pullen.
	T. Allard* .	F. T. Krabbé†	W. Shellabeer‡
Surgeon .	David Lyall, M.D.	W. T. Domville, M.D.	R. M'Cormick.

* Additional for 'Pioneer' tender. † For 'Intrepid' tender.
‡ Second Master.

	Assistance.	Resolute.	North Star.
Mates . .	F. B. Herbert . .	R. Roche . . .	A. H. Alston.
	T. B. Grove. . .	G. S. Nares	
	F. W. Pym (act.) .	Mons. De Bray.	
Asst. Surg.	J. B. Ricards* . .	R. C. Scott† . .	F.Y.Toms (lent)
	F. Y. Toms		
Boatswain .	Mr. Taylor		
Carpenter .	Mr. Kerr	Deans	
Officers and Crews	91	91	40

Includes—Ice Quarter-masters, Marines, etc.: Total, 222; of which each Tender took 30 individuals.

The 'North Star' was added to the Squadron, in consequence of the great difficulty, indeed impossibility, of the other vessels embarking stores from a transport at Disco, and the further probability of my not touching at all on the eastern side of Baffin's Bay. Beyond these questions she was imperatively necessary as a depôt to fall back upon, should either the northern or western division meet with accident. Commander Pullen, having just returned from his excursion along the northern coast of America, between Point Barrow and the Mackenzie, was selected for this command, with a reduced crew, so as to derive the utmost possible stowage. Having been already strengthened for former Arctic service, she was peculiarly adapted for this special depôt. But two clear months, and those at the most unfavourable season, intervened for every preparation (the 15th April being originally determined on as the day of departure).

In as far as the vessels were concerned, they were supposed, having been superintended by Captain Austin, to be complete. Indeed, there was no time to make alteration, if required.

In the Boat department Captain Austin had left me

little to add, but that little was due principally to the kind suggestions of Captain Hamilton, from whom I obtained a very beautiful model of a flat yawl, which, under the hands of the famed builder, Mr. Searle, and the inventor of a light shaving plank one-eighth of an inch in thickness (Mr. Forster), produced four very beautiful ice-boats, two of sixteen and two of twenty feet, the heaviest weighing but 300 lbs. The heavy lifeboats, unmanageable in ice, were left behind, the other boats being more than sufficient to take care of the crews.

In all such expeditions the numberless schemes proposed, and correspondence to be answered, are enough to occupy the attention most seriously, to the detriment of public duty, and the inconvenience of being either drawn into interminable discussion, or the charge of want of courtesy to those unanswered. To all, who may feel so offended, I can only plead, "not want of courtesy," but inability by my own hand. They were answered generally by dictation.

The provisions, clothing, as well as the selection of the crews, remained as principal features, to which unremitting attention was necessary.

Every possible facility was afforded by their Lordships' "special orders," as well as by all their leading officers in the several departments, so that, if anything went wrong, I alone must take upon myself the discredit to a very great extent. Upon the first and vital point, the provisions, I was immediately in communication with Captain Milne, and the Comptroller of Victualling, Mr. Grant; and after recent exposures on preserved meats, it became a matter of very serious consideration.

The beef and pork were cured at our naval establishments at Deptford, Haslar, and Plymouth. The prime pieces alone, free from bone, were selected, and as recent as the time permitted. At Haslar, under the especial superintendence of Sir Edward Parry and Sir John Richardson, our store of pemmican was prepared.

Our other supplies were principally from the firms of Hogarth, Fortnum and Mason, Gamble, Moir, Moore, Allsop, Edwards, Masson, Chollet and Co., Fadeuille; and to the result of my public reports I must refer these parties for the general good opinion entertained of their supplies.

I do not imagine that the reading public will feel any interest in the account of the general amount of provisions, comforts, etc. embarked; but as I have myself frequently been disappointed at not finding the list of extras, and the value assigned to them, I have inserted such a list in the Appendix, with the collective opinion thereon.

Among the leading schemes proposed were the balloons used by my predecessor, and blasting by aid of galvanic agency. In the latter I took peculiar interest, owing chiefly to the success which attended that mode of simultaneous explosion on heavy charges at Round Down Cliff, near Dover, in 1843 (displacing 400,000 cubic yards by 18,500 lbs. of powder!). But chamber-practice and ice-practice are yet to be tested, on which refer to separate article on Ice-Blasting: Appendix. On this mode alone we were not dependent, and were also fully provided with Bickford's match.

From the Ordnance every possible attention was

shown by Sir Thomas Hastings; and at the Royal Arsenal every portion of our equipment was complete within the ability of the Storekeeper. But to Colonel Colquhoun, my old friend and sometime companion, I feel under great obligation, for his unremitting, untiring perseverance and ingenuity in suggesting, as a practical iceman, many little articles of equipment which have proved eminently valuable. Our cylinders, of copper, containing twenty pounds of powder, and fitted with screw stuffing-boxes and galvanized india-rubber packing for the fuses, were most perfect. Our whale rockets and tubes, harpoon-guns, etc. all belong to his fertile mind.

To numerous other individuals not filling public situations our thanks are also due. But as this has been deemed a scientific expedition in connection with the great search, and in which I am happy to associate the names of Kellett, Richards, Pullen, Loney, and M'Dougall, I am sure that they all feel with me, that I do well to reserve for our especial debt of gratitude that which is so eminently due to the Hydrographer, Rear-Admiral Sir Francis Beaufort, for his watchful care over every public as well as private convenience that might lessen our difficulties and tend to our comfort.

Associated with him, Colonel Sabine, Captain E. Johnson, and Mr. Glaisher, have each rendered their time and service to the cause. That the great and primary object of our Expedition could not allow of any delay or deviation from our route, it is needless to observe. But the mind cannot tamely follow the sledge-track, and constantly pore over the weary desert of the floe: it requires occupation, relaxation, and amusement. Such, science

offers. And in the gloom of winter, independent of well-organized registers of the customary requirements of our present improved profession, many scraps will be found worthy of note, and possibly of deeper interest than our scale of knowledge may possibly at the time deem important. The record of nonsense can be obliterated, but the failure to record undeniable facts, only to be witnessed once in a life, is unpardonable.

The instruments from the Hydrographic Office rested on my selection from those in store. Several were made expressly for me, but the deficiency in reliable light altitude and azimuth circles could not be made up. Of these, at least of two more, I felt the want, even of good theodolites. Of the artificial black horizons I must say they were useless—untrue: but the entire blame, if any, rests with me. The five-inch azimuth and altitude, by Cary, was perfect, and saved many a position. It was my companion for fifty-two days over very rough ground, and to the summits of many mountains, without fault or damage.

In the compass department, the Hydrographer and Captain Johnson were unremitting in their endeavours to produce the best travelling instruments, and which should at the same time occupy the smallest space. In all this they acted with their customary forethought and ability; and if the magnetic needle ever was called in aid, the instruments were good.

But in the Arctic travelling season very seldom was it used. The sun, the great umpire in all matters of truth, was not often so long veiled, night or day, but we had his advice. And here, indeed, the labour and forethought

of the Hydrographer furnished the doubtful traveller, dubious of his variation, an unerring Mentor. This was a portable tabular compilation of azimuthal bearings of the sun, at intervals of twenty minutes, between the latitudes of 70° and 81° north, embracing the travelling period between March and September inclusive.

I should make but a feeble attempt to explain these matters to the general reader. Professional men need none. The words of our Hydrographer are too perfect, and they will speak for themselves.

"In the neighbourhood of the magnetic poles the compass becomes so sluggish as to be of little use, either to the mariner in his boat or to the traveller on his sledge, and both are therefore obliged to depend, for the direction of their course, on the bearing of the sun. But in high latitudes the path of the sun is inclined at so small an angle to the horizon, and its rise or fall is therefore so slow, that it is difficult to determine its azimuth or bearing by a rough altitude measured from an horizon encumbered with ice; and a more careful observation, by reflection, would not only consume much valuable time, but would be impracticable in the earlier months, from the severity of the weather, which would render it dangerous to expose the hands.

"Assuming, therefore, that at every station where the boat is moored, or the sledge party is encamped, the apparent time has been correctly ascertained, and the pocket watches duly set; then will the following tables, by showing the true bearing of the sun, enable the leader to adopt what course he pleases, and moreover to adhere to it, by repeatedly looking at his watch and estimating

the angle between the sun and his track,—which operations require no unnecessary exposure.

"The tables are computed for the zone comprised by the parallels of 70° and 81° north, and extend from the beginning of March to the end of September—the season most likely for exploring expeditions; but should their use be required before or after those periods, the intelligent traveller can readily estimate the allowance he should make, by comparing the differences in the preceding and subsequent columns, and by observing the changes produced by the varying latitudes; though the reader will perceive, that even a material error in the assumed latitude would be scarcely appreciable in taking up a line of march."—*F. B.*

This merely evinces the scientific interest in the matter. The compasses themselves were enclosed in neat leathern cases, suspended by a belt (spare pins and needles included), and the magnetic needle itself so adapted to the card that at noon the compass could be set by the sun to tell the *true meridian;* and thus, until a fresh opportunity was afforded of obtaining further proof of the time by that cheering luminary, the traveller was relieved of the perplexities attending the correction for variations amounting to almost half the circle in extent, 142° to 156°.

The libraries furnished to each vessel contained all that was asked, which, aided by private collections, left nothing to be wished for in that department. A very excellent printing press, with full type, was supplied to the leading commands, and was found useful.

In the comforts and extras for the sick, and for the complete equipment for the collection and preservation

of rare objects, and all matters connected with natural history, our acknowledgments are specially due to Sir William Burnett, the Director-General of the Medical Department of the Navy.

The tents, sledges, and general equipments, as on the last expedition, were furnished by the Dockyard at Woolwich. Gutta-percha cases of all descriptions were provided, but none succeeded: they will not stand intense or moderate cold; but some adaptation of this, or Jeffries' marine glue, would, I am satisfied, under judicious arrangement, prove highly important.

On the 19th of March the ship left the dry dock, making a most ominous lurch, and was secured alongside the Dockyard. On the 25th, hauled off to the 'Charger' hulk, and nothing appeared likely to detain us beyond the contemplated day, April 15.

On the 10th of April all the vessels were in the stream, and constantly crowded by inquiring and interested visitors. On the Monday the magnetic instruments were embarked, and a series of very valuable thermometers, specially prepared, from Greenwich and Kew Observatories. Tuesday and Wednesday were exciting days: the presentation of twenty-five silken wrought banners for the sledges, by ladies deeply interested in our success, and our leave-taking from these warmly esteemed friends and their relatives, will never be effaced from our memories.

To the Lords of the Admiralty generally, to Captain Hamilton, Captain Milne, and Mr. Grant, I personally owe my acknowledgments, for the kindness and facilities afforded me throughout the equipment of this Expedition.

To Mr. Barrow all are deeply indebted for his undeviating kindness, anticipating wants which in our excited preparation we had but little leisure to dream of, and for promises fully realized during our absence.

Under such conditions, like spoiled children, with everything our own way—with even the weather favouring every motion of our equipment—behold the Expedition ready, if need be, at the appointed hour!

I have an almost superstitious dread of *indecision*, and do not consider men liable to it fit for any species of trust. And under such feelings, on the 15th of April, much to my relief, the Squadron slipped their fasts to the hulks to which they had been secured, and, towed by the steam-tugs, proceeded down the river.

It was a deeply interesting scene in every sense. Groups might be noticed on the Dockyard walls, scanning with eager interest for the last signal. Now a white handkerchief rose and fell with an almost passionate action. On board frequently a laced-cap individual might be noticed intently gazing through a telescope, and suddenly holding up the badge of recognition. Often the wave of the blunt seaman's hand told where his heart was, "without leave." Fortunately the steam-tug dispensed with any but the sacred duties of the last farewell.

In addition to these interesting matters, the Dockyard authorities had summoned the workmen to line the walls, the band striking up 'Should auld lang syne' and other appropriate tunes, between the peals of cheers which kept our crews incessantly engaged, and which were responded to with equal vigour. This friendly fire was again taken up by our warm-hearted friends, the True

Blues of the Arsenal, and finally by a very unexpected sally from the Minié Rifle division at the Marshes, who had advanced to the river-side.

And now all was silent. Deep thought prevailed, and the fidgety, short walk clearly indicated that some weight had been removed, and that duty was sought for change.

Shortly after noon the first stage of our eventful journey was accomplished, and the vessels secured to their mooring-buoys at Greenhithe.

On the 16th the vessels were swung for local attraction due to the iron on the compasses. My duties carried me to London. Captain Johnson performed this duty, Captain Kellett attending to his own ship. The stowage and iron fittings of the tenders remaining nearly the same, the tables for those vessels remained unchanged.

The 'North Star,' having been detained by provision still unstowed, dropped down and joined company. The powder was embarked in rather large quantity for blasting purposes, and nothing now prevented our proceeding but final instructions, and the customary visit of the Lords of the Admiralty, which had already been duly notified.

On Monday, the 19th, the Board, comprising His Grace the Duke of Northumberland, Rear-Admiral Sir P. Hornby, Captain Sir T. Herbert, Captain Milne, the Private Secretary, and Sir B. W. Walker, the Surveyor of the Navy, inspected the ships, officers, and crews. Privy Council duties requiring the attendance of the Duke in town, the Board left rather in haste, leaving me to receive and entertain Prince D'Aguila, from the Neapolitan Court, for which purpose the state barge had been sent down with Mr. Gore, flag-lieutenant, from Woolwich.

After His Royal Highness had inspected the vessels, he returned to London.

On the 20th Commodore Eden arrived with the pay-clerks, paid the crew up to this date, at which they commence their double pay, and six months' ordinary pay in advance (two months' being customary). Under ordinary circumstances, the payment, with such facility to escape, many having no men-of-war's time, would have been considered hazardous. We had no such feeling on the whole, nor were we deceived. A finer body of men never trod the decks of any of Her Majesty's ships of war. Our North Sea pilots being embarked—the same who took out Sir John Franklin having been allotted to us—I went to London to receive my final instructions, returning by eleven o'clock that night, accompanied by a warm-hearted friend, who had volunteered to see me to the Orkneys, and be the bearer of our last adieus. Such friends are not butterflies. My detention to this date was by superior will.

Shortly after four A.M. on the morning of the 21st we slipped our moorings. The Squadron, towed by the 'Lightning,' 'African,' and 'Monkey,' and tenders under steam, quitted Greenhithe before the good people had time to open their eyes, or think of anything like cheering. About eight o'clock we sighted the ships at Sheerness, the 'Ocean' bearing the broad pendant of Commodore Hope, Admiral the Honourable Josceline Percy being absent on leave.

About nine o'clock, casting off the steamers, we anchored at the Nore, in order to complete the stowage of the 'North Star,' and to make good certain defects

caused by the 'Pioneer' running into us. Here we were joined by the 'Basilisk' and 'Desperate,' reserve war-steamers, commanded by Commander Gardiner and Lieutenant Stevens, ordered to accompany us as far as the 20th meridian west; the 'African' to tow for six days from the Nore.

Commodore Hope came off in the steam-tender 'Sprightly,' and, in order to expedite our supplies, I accompanied him to the Dockyard, the 'Monkey' and 'African' also running in to coal.

Having paid my respects to the Admiral's lady and family, and invited them to visit the ship during our detention, her daughters, as well as those of my old friend Sir Charles and Lady Colville, availed themselves, with other visitors, of the opportunity.

At three o'clock, our defects having been made good, we took leave of our friends, the Commodore passing under the stern of each vessel, giving and receiving in return our three last and most exciting cheers; for here we felt that the final knot was cut which connected us with civilized England.

Our anchors were tripped, and, towed by our respective tugs through the lowering mists which hung over the embouchure of the Thames, we took our last look at the shores of Kent, and dived to our cabins, to meditate on the great work we had undertaken;—not in pride of command, but in the feeling that we were merely following up the clue which others had barely left us enough to hold on by—hardly enough to warp ahead with.

CHAPTER I.

At Sea.—Reach the Orkneys.—Stromness.—Scarcity of Stock.—Departure of the 'Basilisk' and 'Desperate.'—Enter Baffin's Bay.—Whalefish Islands.—Reception by Esquimaux.—Lievely.—Disasters.—Moored at Lievely.—Survey of the Port.—Quit Lievely.—Search for Coal.—Quit the Waigat.

Up to this moment all has gone well. The sun has shed his cheering ray on all our movements, and not a day's rain interfered either with our rigging or embarkation of stores. One cannot but be grateful for all these benefits, and deem them but a prelude, under God's blessing, to a fortunate termination to our efforts.

In tow of the steam-tugs 'Monkey' and 'African,' and accompanied by the 'Desperate,' 'Basilisk,' 'Lightning,' and our steam-tenders 'Pioneer' and 'Intrepid,' we formed rather an imposing than warlike squadron. The tide being in our favour, we moved rapidly through the shoals of the Thames-mouth, and entering the North Sea soon began to feel the old sensations of being again on the ocean. The breeze freshening fast, and my instructions directing the return of the 'Lightning' and 'Monkey' from the Sunk Light off Harwich, the 'Intrepid' also having signalled defects in machinery, I determined on

anchoring for the night, complete 'Desperate' with coal from 'Monkey,' and despatch the latter vessel to Woolwich.

Before daylight, the 'Intrepid' having made good defects, we again moved forward; the 'Assistance' towed by the 'Basilisk;' the 'Resolute' by the 'Desperate;' 'North Star' by 'African;' and 'Lightning,' 'Intrepid,' and 'Pioneer' under steam; but the breeze soon rendering towing inconvenient, sail was made, and each vessel moved independently. As the sea rapidly increased, and would soon render communication unsafe, I despatched my last communication by the 'Lightning,' directing her return to Woolwich; and as the breeze very soon increased and separated the Squadron, and 'African' did not rejoin, I imagine that she followed the 'Lightning.'

April 23.—About one A.M. we rounded the Dudgeon Light and steered for Buchanness, where the consorts, 'North Star' excepted, rejoined.

April 25.—About three A.M. on the morning of the 25th, the breeze failing, the steamer resumed tow, and about seven A.M. the 'North Star' was seen under the high land of Caithness. About seven we took on board an Orkney pilot, and shortly before noon, under a most brilliant and cheering sun, not a breeze moving and sea glassy smooth, we threaded the Orkneys, passing Long Hope, where I had at first purposed anchoring, and by noon were safely anchored off the town of Stromness. The 'Basilisk' was then sent to aid the 'North Star.' The remainder of the Squadron gradually dropped in, and before sunset all were in security, the tenders and steamers within the inner harbour.

This being Sunday, and the inhabitants at church at the time of our arrival, we were not visited until the afternoon, when the Custom-house authorities and Dr. Hamilton came on board, tendering their services.

Understanding from these gentlemen that a vessel laden with coal on sale was within the harbour, I was enabled, before the arrival of the steamers, to make arrangements for their entering at once, to transfer it more conveniently without further delay or expenditure of fuel. This, probably, was the first time that the inner harbour of Stromness bore on its waters four steamers of war of such length and tonnage.

Unfortunately the Post-office at Kirkwall did not forward our letters, notwithstanding that the official envelopes were addressed to Stromness,—possibly, in the expectation that the seekers for them would find their way thither. In this they were not mistaken, as our younger men were rather anxious to commence their explorations and breathe a little pure air,—an example which Captain Kellett and myself soon followed *à pied*, on the rising ground in the immediate vicinity. The observations on the town and scenery are hardly expected in these days, and amount to *nil*. Our attention was chiefly directed to the points and facilities for watering, obtaining the necessary supplies, and other trivial duties.

Nor was time idly expended on board. We had as yet had but our first shaking, and it was not long before my indefatigable aid, Commander Richards, found stowholes for many objects which doubtless puzzled him, and which probably never before lumbered the quarter-deck of any vessel bearing a pendant. These comprised heavy

cases of concentrated sulphuric acid (oil of vitriol), galvanic batteries, balloon gear, *cum multis aliis*, which would probably involve more queries than I would care to answer. At every step these were really obstructions, and some were subjects not to be ill-treated with impunity, even thus far out of Scotland. In the midst of all these duties, involving almost a restowage of the ship, watering, coaling, etc., we began to discover that our private stock of animals and other requisites, involving the comfort of both inner and outer man, had been most peculiarly overlooked. The natives, too, had discovered our weakness, from a certain *furor* displayed by one or two leading purchasers, and did not even, while thus patriotically and philanthropically engaged, fail in forming just estimates of the contents of our purses, probably understanding from previous visitors that men-of-war's men are fair game.

Independent of any such feeling, and setting aside any presumption that stock here is cheap and easy to be procured, I would strongly advise my brother officers not to trust to any such fallacy beyond eggs, milk, and butter. Animals, ducks, fowls, etc., are not fit to kill, do not live, and turn out eventually very dear bargains. But this applies in most minor ports. It is only the practised stockman who will supply objects fit to eat, or which will endure the caging on board ships.

Our rambles exhibited to us, or rather to myself, no improvement since my visit to the Orkneys in 1821,—a private individual, and most warmly and hospitably entertained by some good friends at Kirkwall, whose names have escaped my memory, but their kindness has not

been forgotten. Possibly they recollect me at the Manse only as the inquisitive "stone-breaker." I rode over to Stromness and back the same evening. To expect hospitality or attention under present circumstances would be unfair: who could entertain such an army of locusts?

One of our deserters, or rather an unfortunate middy whose dreams were more powerful than the cheers at parting, had now given himself up, having posted and railed, express, through two parts at least of Great Britain to overtake us, and crossed by gig from Kirkwall. As there was no "cheque without leave," no further questions were asked; I was only too glad to see him. By him we received information that the steamer which brought him to Kirkwall would depart on the next day evening for Aberdeen.

I had now to lose my kind companion Mr. E. Ray. We took leave of him on the evening of the 27th, seeing him off by the mail-cart; and to his kindness, and interference with the Post-office, I feel that we in a great measure owe the reception of our letters by our return officers. He carried with him our final despatches, with which he would sail at dawn on the morning following for Aberdeen.

April 28.—Fortunately we obtained the sun for our chronometers at two P.M., just as the weather began to exhibit a suspicious, murky appearance, when the Squadron weighed, cleared the islands, and was once more on its forward progress. The absence of the 'African' we now felt seriously; her services might have proved important to tow out the 'North Star,' as in this thick weather one more tug would have kept us securely con-

nected. We were compelled to lie to—and that is, under tow, a most tedious operation—until one of the steamers could extricate the 'North Star;' much valuable calm and offing in this variable climate was thus lost.

Having fairly gained an offing, the 'Basilisk' was allotted to the 'Assistance' and tenders, and the 'Desperate' to the 'Resolute' and 'North Star.' About four A.M. on the 29th, we passed Cape Wrath lights, and before nightfall had cleared the northern end of Lewis Island.

We were now truly at sea. My instructions were explicitly *limited* to taking the two steam aids as far as the longitude of 20° west. It was my intention, on reaching that meridian, to complete the tenders with coal, and then release them. That the orders were worded so imperatively was unfortunate. Had it been simply, not to carry them beyond their safe means of return, I might easily have taken the supplies out at an earlier date, or, at reduced coal, worked a day or more longer, until smoother water prevailed

Unfortunately this distance was not made good until Sunday, the 2nd of May, when the labour did not appear sufficiently imperative to disturb that day of rest; but, the breeze suddenly freshening at nightfall, and towing-hawsers parting, it became necessary to make sail independently.

Bad weather continued until the 8th of May, when, taking advantage of a lull, we communicated with the steamers, exchanging a marine and taking their towing-hawsers. Our despatches were sent by the 'Desperate,' Lieutenant Stevens, as being more likely, by steam and

canvas combined, to reach Plymouth, and, by rail, London, earlier than the 'Basilisk,' bound to Portsmouth with paddles and canvas. Much pleased with the diligence and handling of these vessels by their respective commanders, we cheered and parted company, thus severing the last link on this side of Greenland.

Shortly after parting with the steamers, we fell in with a dead whale, and began to experience the customary visitation of the fish-hunting birds, mollymoks, gulls, etc., of Greenland. On the 15th of May, being in latitude 57° 56′ north and longitude 38° 26′ west, we were visited by a snow-bunting, and on the 20th noticed the first iceberg; but, although we passed between several small pieces of ice, neither the air nor sea exhibited any change of temperature.

On the 1st of May we passed Cape Farewell, and on the 24th were becalmed off Godhavn. The dredge was sent down and some few shells obtained, but the cod-fish and halibut, notwithstanding the most enticing baits were tried, could not be induced to bite. Suddenly a long rolling swell came in from the south-west, causing the vessels to pitch very heavily, and, as they rose to the summit of the wave, exhibiting the land-ice, not before noticed, as lining the coast-line. The effect was curious, and not pleasing.

The customary routine of such tedious navigation continued until the 29th, when we got a fair wind and ran up to the Whalefish Islands.

As customary in these cases, reference was made to "the voyages," and to persons on board who had been here before; but no one could afford any information

calculated to be of use. We were therefore compelled to grope our way, aided by our dead reckoning.

To the seaman seeking Whalefish Islands nothing can be more deceitful than the first sight of the group, when distant about ten miles, and more particularly if the wind should be light and the sea very smooth, when probably it would prove glassy calm at the islands. They would then appear merely like a scattered reef on the surface of the ocean; but the mystery is easily dispelled. If they display a wide extent, you are to the south-west; and if you bring them to bear nearly *true north*, you must be in the fair way for the entrance, which is by the south-east end of the southern island. E.N.E. by compass, they show in the centre of Disco and as one island.

The two main islands are high, about *six hundred feet*, and will exhibit a deep gap between them. It is in this gap, about half a cable wide, that vessels anchor. The Danish Establishment is on the southern island, termed Kron-Prins Island. If the breeze be steady, shave it on the east, as a rock lies off about a cable's length north-north-east *true*, and run for the gap until Boat Isle is seen midway in the channel; drop anchor in the mouth, and veer to secure to either or both shores. Five of Her Majesty's ships were safely berthed well within the mouth.

The latitude of Boat Island was determined to be—latitude 68° 58′ 42″ N., longitude 53° 13′ W., variation 70° 46′ 39″ W.

In Captain Mangles' account I notice that Sir John Franklin was much in the same dilemma as ourselves;

indeed when I was first informed that they were truly the Whalefish Islands, I could scarcely credit it. They did not appear to afford the slightest chance of shelter.

On the other hand, no seaman who has once visited them, and used his eyes, can for one instant be in doubt. There are no others to mislead him, if he approaches them on the proper bearing. Disco may also be in sight, and the very remarkable mountain over Lievely will, bearing north (true), be an infallible aid. If these islands should be sought from the northward, bring the easternmost point of the high eastern island to bear south true, and run down until you perceive the channel, with a rock in the centre, between the two highest islands. Round all rocks easterly, at a good berth, and enter this channel boldly; steer for the starboard channel; pass Boat Island; after which run for the port side, to avoid a rock, close in shore, on the starboard hand; anchor as you open the narrows. Bergs sometimes plant themselves at the southern mouth of this gully; it is therefore safer to be well within, as they ground and may break your anchor, if you should be just outside the opening.

The moment any vessel is noticed steering for these islands, the Esquimaux, or "Huskies,"* as the Danes customarily term them, come off in sufficient numbers to satisfy you that you are near the haunts of uncivilized men, and will afford sufficient information to guide any stranger to his anchorage. They are all in the pay of, or dependent on, the Danish Resident there or at Lievely, and carry on the seal-fishery for the Company's interest.

* "Husky" is their own term. I recollect the chorus to a song at Kamtchatka was "Husky, Husky."

The establishment at the Whalefish Islands must have degenerated in a most extraordinary degree of late years, if it ever deserved the reputation of having one decent house in it within the memory of man. Never did I witness such utter filth and degradation in any Esquimaux western tribe in my life; but visits to Lievely, Upernavik, and Cape York, satisfy me that the tribes here are more filthy. Upon the occasion of our visit, nine kaiacks formed in line ahead, awaiting our arrival, with lances poised, as if we had been some mighty monster of the deep they intended to attack. These kaiacks probably were manned by their select men, and intended to exhibit a visit of courtesy, as they were better clad than we afterwards noticed. They kept up with the ship, throwing their spears at objects which offered, recovering them with great agility as they came up with them, buoyed by their light fish-bladder. One unfortunate *lumme* was struck, probably gazing in astonishment at us, but pursuit was overbalanced by the chance of the nice things they might pick up from us, particularly as it was our dinner hour, and Jack is generous in his way. They probably had seen the ship before, but no whaler ever could be mistaken for her. Many of them have some pretension to head and stern, and are even gilded; but why our predecessors deemed it expedient to make our vessels so unlike anything before created, not a little perplexes me, for in truth we have less of the heavy ice to encounter. The day will yet arrive when whalers, or those intending to amuse themselves in "northern researches," will prefer clipper-moulded vessels, instead of tea-chests.

Our time here, whilst refitting, watering, and restowing our holds, was employed examining the islands and shooting ducks, chiefly the eider (*Anas mollissima*). As to any communication with the so-called Governor, or oil-cooper to the settlement, only distinguishable by a white face and reddish hair from the as filthy Esquimaux, there was no inducement. Taking our departure by the northern route, on the 5th of June, we passed up the eastern side of the group, in search of Lievely.

The same remarks apply to information about Lievely. It must be sought by latitude and longitude, being situated in latitude 69° 13′ 56″ N., longitude 53° 42′ W.

The surest and unerring mark is a flat-crowned beetling cliff, about one-third from the western point of Disco, where indeed they appear to terminate. On nearing the land, which is "safe to," the rocks which form the port of Lievely will be seen to project well to the southward, and fine gravelly beaches commence immediately to the eastward of the rocks which, externally, form this very close port. It is indeed the port of the *island* of Lievely. At about two miles westerly from these fine dark gravelly beaches, the jutting angular headland will exhibit the great red beacon, which at once sets further doubt at rest.

This beacon is on the outer south-west head, and has a deep bay within, which at first sight might be mistaken for the port. Steer past this bay on the outer side of the islet, which lies off, and round the next inner point, within which a deep strait will open, and pilots will meet the vessel. The port lies at the eastern extremity of this strait, and is a most perfect, land-locked, safe anchorage.

The town cannot be seen until you reach the eastern bight of this strait.

In our case, the tenders having been directed to look out, the beacon was signalled by 'Pioneer;' and running in with the ship to a safe distance, I left in my gig, to ascertain where the port lay. I was much puzzled by the outer bay; but immediately on rounding the inner point, the warping-rings let into the rocks, and numbered, clearly indicated where to proceed. I was not a little surprised to find that no pilots were coming out, and, until I reached the Resident's house, that none were ordered; but they immediately accompanied me in their own whale-boat, and on opening the point I made the signal to the ship 'to steer for my position,' advancing in the course which she was to maintain. This was immediately complied with by Commander Richards, and rejoining off False Bay, we stood in, prepared to beat up to the harbour. I had hoped that the ship would have beat in to the anchorage in decent style; but fate seemed to decree unusual disasters, and either flurries of wind or counter-currents acted to the annoyance of each. The 'Assistance,' always weatherly outside, would not keep to the wind, and lost ground in tacking. The pilots (too many) were all uttering unintelligible jargon, and giving contrary orders, twice putting us on the same rock without damage, owing to its abruptness; so that I found, with such a strong breeze prevailing, that it was necessary to anchor. In the meantime the 'Pioneer' had made love to an iceberg, which deprived her of her mizenmast. 'Intrepid' grounded in stays; 'Resolute' anchored; and next morning, after it moderated, and the

wind favoured us to get in, 'North Star' tailed on the harbour spit, and remained one tide. We all had our taste of beating into Lievely. Had all this happened to raw hands, it would have been clear enough, but we had too many surveyors accustomed to greater difficulties. The undertow must have been the cause, by the strong wind from the eastward forcing the water through the channel on the east, at the same moment as the flood was making high water on the surface from the west. One decided point in my own mind was the want of rake to our mizenmast. This I had strongly urged before leaving Woolwich, but it was not complied with. I now insisted on its being done: the result has proved that I was right.

Having all the Squadron now securely moored in this beautiful little harbour—none under the length of any five hundred ton ship—I began to reflect how any one could venture to waste time by frequenting the Whalefish Islands, when such a complete refuge as Lievely could be gained, with a civilized Governor, clad at least with respectable clothing, and gentlemanly in manners, and where every other accommodation which a port should afford was to be obtained. Port charges might prevent the generality of whaling ships from entry, but this could not influence vessels of war. Referring to Sir E. Parry's remarks, I notice that he only visited this port in his boat in 1824, and, unless he sounded it, or consulted the pilots, could hardly be supposed to know its capacity. He considers it excellent for small vessels, but narrow for ships of three hundred or four hundred tons. I should be very glad of such a harbour for three sail

of the line. It conveniently accommodates five sail, in berths where fifty-gun frigates would be safer than in Portsmouth harbour.

The Governor, Mr. Erasmus Möeldrup, showed us every attention, and afforded us all the information in his power. A survey was made of the port and entrance, and some of our sportsmen managed to find exercise and amusement, if not game, by climbing some of the frowning hills immediately over the anchorage, particularly that which I have noticed as the best guide in seeking this port. This hill, estimated by some of those who had not tried its ascent, was estimated at seven to eight hundred feet above the level; measurement, however, proved it to be 2100 feet. The Governor and family were entertained on board both vessels, and some of the younger hands had an opportunity of getting up their polkas and quadrilles, etc., with some of the half-breeds of Danes, who really performed to admiration, and having been duly dressed, from "the theatre property," in European feminine costume, were not wanting in beauty.

Having obtained seal-skins for booting our travelling parties, and other supplies, we quitted Lievely on the 10th of June, intending to examine a locality in the Waigat, where the Governor informed me that coal abounded, and might be obtained at the beach with little labour,—but that it was cheaper for them to get it from England, than to pay the wages demanded by the Esquimaux.* Another spot, within forty miles, was also named.

As the ice threatened westerly, I hoped to get round inside it by the Waigat channel, coming out by the north

* This coal since visited by the 'Phœnix.'

end of Disco, and therefore determined to seek this coal. Our dogs were procured here; but we did wrong in trusting solely to the Governor: he had some which he wished to get rid of. We were informed that all the best bred were absent hunting.

Light airs delaying us, I quitted the ship in my gig, near the entrance of the Waigat—a sound which divides Disco Island from Greenland; and keeping along the shore, at length reached a spot where the banks exhibited unmistakable signs of a coal-bearing district. The coal was found in detached pieces on the beach, but not in sufficient quantity to reward delay. I therefore moved easterly, to the mouth of a great valley barred by sand, and which appeared during the summer season to be the bed of some great river. Within, it being low water, it was cut up by streams in all directions, the sea-beach forming a kind of barrier. Strewed along this sandy beach, about three bags of loose pieces were picked up; but no cliffs, banks, or rocks near, which exhibited the slightest chance of coal *in situ*. The surrounding hills appeared, at two or three miles inland, to be formed of some very dark stone, constantly disintegrating and tumbling down into the valleys; but neither time nor labour could be afforded to examine them. The Governor's explanation, that "it would not repay the labour of collection," was but too apparent. That this was one of the spots alluded to, as "near a house forty miles east," I was fully satisfied, as he had informed me that it was at a sandy beach not far beyond where they had a *house;* and this house I visited, and similar coal to that picked up on the beach easterly had there been

used as fuel. Further along the coast a party again landed, but no traces of coal: it must therefore lie inland, and is probably brought down by the heavy streams which the thaws throw down through the valleys. The interval between the nearest mountain-faces and the shore was covered by a thick peaty soil, in which a person would sink deeply in any thaw; the labour, therefore, of transporting coal, even if it existed within one mile, would be excessive.

During the day and night previous to our departure from Lievely, it had snowed heavily, and covered the land generally to some depth; but the line separating this coal-bearing region was most clearly delineated by the total absence of snow,—doubtless due to the generation of heat by the previous thaws and sun's rays acting upon the shaly beds, charged with iron pyrites. To the eye, as viewed by telescope, the hill-ridges appeared to be composed of a slaty shale, or coal, cropping out occasionally like dykes, and were in immediate association with a ferruginous clay, deeply channelled by late thaws.

The coal found was not bituminous, but more of a slaty wood-coal; burned well and retained its heat when mixed with other coal, and would be admirably adapted as an aid for our steamers, especially for banking up or retaining low steam.

A white fox came to inquire our reasons for visiting this part of the country, but departed abruptly before he came within gunshot.

As the evening continued calm, I sent the officers on shore, to shoot and amuse themselves by making further researches inland towards the black formations; this

latter they found too tedious, by reason of the yielding peat over which they had to travel; but they were more fortunate in securing several brace of ptarmigan, now very acceptable to our invalids,—particularly Captain Kellett, nearly on his legs again, and regaining his customary spirits.

June 12.—Having contended in this neighbourhood for some time with strong breezes, and loose ice increasing so fast as to render the navigation a severe duty to the crew, even to keep the ship clear of it, and the prospect to windward unsatisfactory, I bore up round the south end of the island, and, passing Lievely, reached the sea again, now invested with larger and more numerous bergs than we had before noticed. This, however, indicating a great southerly motion, afforded me hopes of making an easier passage, as these monsters generally clear away all before them and break up the small floes.

I notice that the Danes differ from us, in terming these masses "blinks," whereas we apply that term to the reflection of ice or water, as ice-blink, water-sky.

CHAPTER II.

Anchor at Upernavik.—The Squadron adrift.—Dangers numerous.—Prospects of the Voyage.—Browne Islands.—Preparation for Flitting.—The 'Resolute' nipped.—Docking.—Blasting Ice.—Wreck of the 'Regalia.'—Meet a Whaler.—Irregularities of the Crew.—Melville Bay.—Floe Law.—Capture a Bear.—Cape York.

On the 16th of June we had reached the western entrance of the Waigat Channel, and found it closely blocked; the ice also, to seaward and the north, apparently closely packed; but in this we were undeceived as we neared it, several lanes opening, which admitted of sailing, by a little caution in selecting the weakest points for breaching. The floe pieces, or flat ice, were so much eaten into and rotten, that, if due calculation was made for the impetus in running into them at almost natural fissures, no difficulty existed in dividing them and reaching the next "lead." After some little excitement of this nature, and giving a few shakes to the old craft, merely to let her know that she must awaken to her old duties, we reached the open water, and were making good progress, unflattered by further obstacles, to the northward.

On the 18th we were off Anderson's Hope; winds light and adverse. Beat up amongst the islands, and,

as usual, no one able to speak distinctly to any land in sight,—and yet so remarkable, that he who has once seen ought never to forget it. Late in the evening, as we reached close in upon one of the islands, it was thought, on the view we had of a very high perpendicular cliff (3300 feet), that it might be "Anderson's Hope;" but I, who had never before seen the land, knew full well where I was: but where to find the anchorage at Upernavik was the mystery to be solved. The difference between noon and midnight, in this latitude, was scarcely taken into account by us, and therefore I felt surprise that no colours were exhibited, or pilots came off. They were all asleep; it was past midnight.

Early on the 19th, a boat, manned by Esquimaux, came off, but no Danes. At two A.M. I sent the cutter, with the master, to seek for anchorage and point out the settlement. Still no notice was taken of us by the Danes; nor could we distinguish the settlement. At length we noticed the cutter, in a deep bight, with the signal flying for anchorage, and shortly after discovered the chapel and residence of the Superintendent (or Governor) on a point above.

Upon the return of the boat, we stood in to a small but snug bay, open to the northward, and anchored, securing to a small islet, as well as to an iceberg grounded off the mouth of the bay.

I now proceeded to call upon the Governor, Karl Gelmeyden Flaischer, and received from him every attention, apologizing for not sending out any pilots, as most vessels frequenting this place are well acquainted with the usual anchorage. We obtained about twenty

good "water-skins" (a peculiar seal), for the soles of our travelling-boots, which we were unable to get at Lievely; purchased boots and mocassins, pup-seal skins for linings, and sundry curiosities, Esquimaux models. The priest also, Jens Michael Peter Kragh, came to pay his respects,—a sharp, intelligent man, particularly conversant with the value of a British sovereign. Both these individuals were the offspring of mixed parents on the mother's side and Danish fathers, were born in Greenland, and partially educated in Denmark. Their wives are Danish, and the children interesting, animated, and likely to be handsome. We were also introduced to a pretty dark-eyed brunette, the daughter of Petersen, who accompanied Mr. Penny as interpreter in his late expedition. In the window of the Resident we noticed several varieties of flowers in bloom, but principally natives of Greenland, although common in England.

We were most anxious to obtain seal's flesh for the dogs of the expedition generally; but my endeavours were completely frustrated by the interference of private interests, by which the natives were induced to demand as much for one carcase as the Governor informed me would have purchased all in the colony. The result was, that all were disappointed; the Resident absolutely refusing to allow any sales under these exorbitant demands.

In the evening it came on to blow very fresh, and I now began to congratulate myself in not trusting to the stability of bergs; our bower anchor was well placed, and an intervening rocky ledge prevented the berg from driving upon us.

The 'Resolute' commenced by breaking adrift, owing

to the turning of the berg; 'Pioneer' fell foul of her, taking away, the jib-boom of 'Resolute,' and losing her own fore-topmast. Both went adrift in a strong gale, with thick fog, into the Strait.

Our own berg, although close in shore, took leave of us, carrying off the ice-anchors and hawsers of the 'Assistance,' 'North Star,' and 'Intrepid.' The uncertain condition of the 'Resolute' and 'Pioneer,' in fog and bad weather, amongst rocks, kept us in unpleasant suspense during the night, but fortunately they rejoined the day following, when our hawsers, etc., were also recovered. We dropped our second anchor, and rode it out comfortably, although the gusts at times were very heavy.

June 20.—The day turned out very fine,—bright sun, and little wind. After prayers, I took leave of the Resident, and joined the vessels outside, but, fog coming on, had some difficulty in collecting the Squadron.

We now passed in to the eastward, between the islands, into the Great Sound, having been informed that "Sir James Ross did so, and avoided much unpleasant ice." But in this we were mistaken. After knocking about until midnight, frequently obscured from each other, and the sight of land, by fog or snow-drift, and without any appearance of an opening, I determined on effecting my escape by the first western outlet between the islands. Within, as far as we had proceeded, the ice was fast. With our accustomed good fortune, we soon hit on a fair lead between them, and just cleared the southern band of ice, interposed between us and Upernavik.

This neighbourhood is very dangerous to navigate, and I have been since informed, that scarcely a whaler passes

by this route without striking on, or discovering, some new rock. Several were noticed by the 'Resolute,' as well as ourselves, just capped by ice, and both escaped once or twice; the 'Resolute' found out her mistake when intending to graze the ice which concealed the danger; great caution must therefore be exercised. As to fixing the position of any which we saw on the charts, it was impossible: fog and other difficulties entirely prevented our knowing where we were.

If one calmly casts his eye on the chart, and there views the dots decorating the coast, each of which is intended to represent an island—and sixty of such dots would represent sixty miles—the difficulty of placing anything there to warn navigators may be understood.

The navigator in these regions must, like the pilots of the Bermudas, carry his chart in his head, and use his eyes properly. Latitude and look-out may help him, but the water is very deep—too deep for the lead—and but few soundings on the chart.

Before quitting this neighbourhood, I will endeavour to give my own opinion as to the approach to and anchorage at Upernavik. It is necessary, in the first instance, to know the latitude and longitude of the place bound to. The anchorage point of Upernavik Bay is situated in latitude 72° 48′ N. and longitude 55° 53′ W., about one mile east of the church. The Danish vessel, which makes her annual visit, I am informed, moors within a line of rocks, in the depth of this bay, which forms a natural dock; and she is, I doubt not, in perfect security, if properly provided with ground-tackle. Our anchorage in the outer bay showed the flag-staff of the

settlement open between the two outer islands, in eleven fathoms stiff clay, with a ledge of rocks, probably, between us and the anchor, as the grinding noise of our cables evinced, and the anchors and hawsers used in warping were entangled with much kelp. The anchor was let go when the flag-staff was clear outside the rocky islet.

The approach to Upernavik is considered to be safest by "the inner passage," immediately under the high cliffy part of Anderson's Hope, inside of the two islands. When the last point on the right exhibits the eastern passage open, haul easterly and southerly withal. The settlement will be noticed about south-east, on the starboard hand, with the Danish colours flying, and a white-faced chapel beside it, unless you happen to do as we did—visit it at midnight: then, even a gun, unless charged with sovereigns, might not elicit much attention. Even the Danes have very sound ideas of luxury: in such climates it requires great inducement to get out of bed. Some of the officers of the 'Resolute,' I believe, visited the "Rookery" and Plumbago districts; but of this I am unable to give any account.

Having now, I conceive, done my duty to those mariners who may follow me (?), I shall proceed with our monotonous voyage; for really, but to seamen, I cannot flatter myself that bergs, floes, sailing ice, etc. will greatly interest any one not in want of such information. All narratives of voyages of this nature demand great indulgence from the general reader. One should possess the pen of Marryat, Hall, or Glascock, and indeed coin interesting matter, to induce any one to enter these pages.

I cannot play the humorous or the buffoon, but truth, simple truth alone, in such pleasant terms as I can reduce it to, will prevail. I have nothing to gain, nothing to fear: my own family motto must guide me throughout. Those who despise "Loyal au mort" and loyal to facts, must not depend too much for amusement in this narrative.

Our departure from Upernavik, to use the seaman's well-known expression, was the "hoisting in of our long boat." Henceforth we must be considered at sea, and dependent on our own resources. Cut off, for a series of years, from any but our own companionship, and dependent in no small degree upon the *boná fide* constituents of our society, power ceases, and the will of the least amongst us may create *bella, horrida bella*. Upon what a volcano do we stand! The sullen chief, if he be so, must chew the cud, and vegetate year after year in sullenness and vexatiousness of spirit. No such purgatory could exist, better calculated for a man of narrow mind, —none so dangerous to a sensible mind. Such then being our feelings, I proceed, in charity with all men, not perfect myself, and willing to overlook all faults in others, provided they do not, when I tell them of it, still continue to tread upon my corns.

I had a very strong inclination to cut across direct for the west land, under the impression that we should find less obstruction; but the predominant feeling being in favour of Melville Bay, being myself but a Johnny Newcome, I submitted to the ice-masters and others, who thought they knew better, and followed up the whalers, reported to be about twenty days in advance of us. I

am far from believing that I did right, with regard to the shortness of passage; for I firmly believe, a very little perseverance in maintaining our westing would have rewarded us by open water to the westward.

June 21.—The longest day,—and certainly a very long one, to most of the executives at least. Thick fog came on, causing a separation from our consorts, but fortunately cleared up in time to prevent mischief,—for no two appeared to have their heads in the same direction. The 'Resolute' alone was standing directly for us, having heard our guns and fog-signals, and answered them. The afternoon turned out beautiful. Aided by a light fair wind, we continued to thread the passages between the icebergs, at one of which we tried the three-pounder, shotted, expecting the concussion of the air would cause some huge fragment to separate, particularly as it exhibited many deep vertical fissures; but not the slightest splinter moved.

We soon reached the termination of the open water, and secured the vessels to the floe or sheet of field-ice, averaging generally from three to four feet in thickness, six-sevenths of which are supposed to be immersed; but we found by experiments, at a later date, that eight-ninths is nearer the truth. The weather being foggy, we were unable to see any distance, or to select any position near to any probable opening.

On the morning of the 23rd, on the fog clearing off, we discovered that we were rather too close to one of the Browne Islands, in four and a half fathoms, added to which the rocks under our bottom were too visible to be pleasant; moreover the ice was drifting us fast

towards the island. The 'Pioneer' was immediately put into requisition, and, having got her steam up, towed the whole Squadron into deeper water.

Had it not been for this unfortunate interference, I should have landed, and obtained observations, to fix some of the other objects in sight, as well as sought for the eggs of eider-ducks, said to abound here. I was only able, on a moving piece of ice, to obtain the latitude, which placed us in 74° 7′ N., the Devil's Thumb bearing north-east fifteen miles; shortly before midnight, the ship was secured to the floe.

About noon on the 24th, the steamers having now become indispensable, they towed the vessels through a lead until eight P.M., when we secured for the night,—or rather to afford the crew rest, for it is almost an absurdity to talk of nights during the summer in these high latitudes. "Midnight" however becomes a term of time; and at this hour a large berg, in rapid motion towards us, compelled us to again resort to our steamers, which towed us sufficiently out of its way, but unfortunately with the loss of two dogs, which, not yet sufficiently familiar to their new masters, and possibly over-fed, preferred amusing themselves on the ice to rejoining their ships. A boat and parties were sent to recover them, but without success. They were again seen on the floe-edge the following day, and the boat sent to endeavour to take them, but although food was taken to entice them, still with no better success; starvation, or the gripe of some hungry bear, would probably very soon be their fate! Little as we knew these poor animals, still their loss was perceptibly felt.

We had now reached "Melville Bay," and the remarkable objects known as "Devil's Thumb," "Sugar-loaf," "Melville Monument," and Cape Walker, familiar to Arctic navigators, were all clearly defined, and apparently very near. But the positions on the chart, if they be truly placed—and we have reason to doubt it—would place us about forty miles from them.

June 26.—Lat. 74° 34′ N., long. 59° 23′ W.—We had a most beautiful day, the sun bright, temperature 36°, and were able to determine our advance to have been about thirty-five miles north and twenty-five miles west during the last twenty-four hours; we obtained soundings, with 320 fathoms; bottom, coarse ground, with stones and coral. Our arrangements for "flitting," or deserting ship, in the event of getting nipped by the ice, were already made, and the necessary provisions for each boat stowed on deck in readiness. Each person was supplied with a bag, in which a complete suit and change of underclothing were kept stowed, so as to prevent confusion; officers and men were told off to their respective boats; in fact, every arrangement complete for leaving the ship in the most orderly manner.

I think I can perceive the curl of lip of some fastidious friends, who may deem these matters absurd; but there is always an *official* mode in burning, sinking, blowing up, or abandoning a ship of war. Whatever happens in a well-disciplined ship, becomes less inconvenient by every man knowing his duty; no confusion then results, and less loss of life or property is heard of.

It may appear strange, but doubtless it will be remarked in the course of our expedition, that "coming events cast

their shadows before them." About eight this afternoon, the change of tide or current set the western ice in motion southerly. As we had no wish to travel that route, our vessels were removed to the opposite or land-floe, and, as we thought, in a place of safety; indeed, the space of open water seemed to promise us security, and I had intended to remain quiet the ensuing day, Sunday, giving the crews their full day of rest. Shortly before midnight, however, I was informed that the floe was in motion and closing on the 'Resolute,' and that she would probably be "nipped." The others were all more in the cavity of the bay formed by the ice. Before I succeeded in gaining the deck, the 'Resolute' was in agony, and had a considerable list (heeled over). The rudder in a few moments was destroyed, and the pressure then appeared to cease,—the floe brought up, possibly, by some opposition to the northward. The motion of the ice was almost imperceptible, but we had now before us pretty conclusive evidence of the nature of the heavy gripe which this insidious enemy was capable of inflicting almost in dead calm. It was not a direct pressure, but the grinding power of two unequal forces, acting laterally in opposite directions. The best illustration to my fair readers would be to imagine the ship to be the roller of a mangle. The pressure strained the 'Resolute' a little, lifted her above her line of floatation some eight or ten feet; the bells were set ringing, glasses clattering. The sick did not care to remain below; indeed, in a few minutes they might all belong to another vessel, and our noble consort *hors de combat:* and yet not the slightest noise or confusion, and no

apparent fear of wreck; boats and gear ready on the ice. This was a calm nip, and here it ended, with merely the loss of rudder; but had the outer floe been pressed by the addition of wind, distant, although not felt by us, and the "*piling*" of the broken floe commenced, which result generally continues until all the weaker points have yielded and the giants are firmly opposed by equal resistance in each other's embrace, the consequences would probably have been serious. In very few minutes every rudder of the Squadron was unshipped and hung to the stern-davits, and parties engaged cutting docks for the vessels, a duty on which the crews were engaged until nearly six A.M. About four the 'Resolute' was released, and docked with us; and as her rudder was found too much injured for immediate repair, the spare one was got up, put together, shipped, and ready for service before the following noon.

I am aware that my naval friends will require no explanation as to "docking" in ice, but landsmen may wish information, and, dry as it may be, I will endeavour to afford it in as few words as possible. I have already observed that the danger consists in being caught between the edges of two fields of ice in motion, and that, when these bodies come into contact, with a force impossible to calculate, all weaker objects, including the icy projections themselves, undergo "the crushing force," until equal forces overcome the causes in operation. It must therefore be very apparent, that where such vast surfaces, miles in extent, are so firmly cemented together, if objects be sufficiently withdrawn into gaps within the line of their opposing vertical projections, they are safe.

It is therefore customary, by the use of ice-saws, varying from ten to seventeen or eighteen feet in length, from a quarter to half an inch in thickness, and about nine inches wide, to saw out a space which will admit a vessel twice her own length, and a few feet wider than her extreme breadth, within the irregular edge, and which will become completely sealed, should an adverse floe close its mouth; or, to refer very simply to every-day practice, it is just backing up some alley, if one is in the way of a runaway beer-dray in the Strand.

In the present case we discovered, even with three ice-masters in each vessel, and much other assembled talent and experience, that there is always much to learn, and moreover, to facilitate any uncommon service, that method is imperatively required. Our docks, constructed in haste, and without previous organization, were imperfect, and therefore we were compelled to cut deeper,—incurring double labour.

As our men and officers were now stationed to each saw-gang, I had the opportunity, as this work was *leisurely done by one watch*, of determining the rate of work on which I could rely in ordinary cases. The average cutting of three-feet ice I found to be at the rate of ten feet in three minutes, which, if no obstacles opposed, and there was external space into which the masses could be floated, would allow of "cutting in" in forty minutes,* or less, if danger threatened. Every officer in command should, whatever may be the service required, estimate, nay determine, truly, the power at his disposal; and not until then is he competent to order, decide on, or reject any contemplated movement where time is involved.

* Later experiments: 1.40, docked; 1258 tons ice removed.

In these our early operations, recourse was had to blasting, to aid the clearing of the decks. Charges, varying from twenty to four pounds, were tried; but the least possible quantity of powder which will effect a crack, the more judicious. This is very easily understood by any person endeavouring to extract by one end, and horizontally, a pane of glass from a sash: the entire pane may slide out freely, if whole; if broken at convenient angles, it may come out by pieces; but, if severely cracked in *radii* from the centre, it will be so much pressed at the sides as to require to be removed piecemeal. Ice is still more stubborn. I am fully satisfied that no man who really understands his business, and is not pressed for time, will call in the aid of gunpowder. It is highly dangerous to the dock-sides, which it generally splits, and causes to tumble to pieces the instant it becomes relieved from pressure. Blasting ice is in itself quite a distinct science,—as much so as flint-making, pebble-cutting, or geological operations.

But, in dealing in the theoretical points, I must not lose sight of the actual manœuvre, which is of itself quite an exciting spectacle. I have before stated that method is indispensable; it therefore becomes the duty of the officer superintending to have all his men duly stationed: an officer to each saw-gang and triangle; the carpenter, with his crew, to line out the dock; and others ready to carry out any special orders of the chief. The carpenters line out a space of a wedge-shape, once and a half the length of the ship, say a hundred and eighty feet in length, on a middle line, sixty feet wide at the outer mouth, and thirty feet at the inner extreme. The side

lines are then cut by the saw-gangs; and, as soon as they have fairly commenced, diagonal lines are followed up; triangles or jib-pieces (for which see Appendix) are shaped out, which are removed as cut. On the pipe "Dock ship!" the officers with their saw-gangs immediately repair to their proper saws and triangles, and march off to the floe, two to the saw, two to the triangle, and four to the "gins" and "bell-ropes," in much the same order as artillerymen to their gun-gear, and await orders. The first few feet is a silent duty; but "Now, my lads, for a song!" and at it they go cheerily, never forgetting those nearest their hearts, as "Sally is the girl I love so dearly," and similar improvised measures, cheering on the duty, occasionally interrupted by a simultaneous burst, or yell, from some, at least to us, unknown cause.

The icemen of the 'Resolute' consider that vessel to have had a very narrow escape, and I perfectly believe, with them, that no whaler could have withstood the pressure to which she was subjected. The result has produced a more serious preparation for "flitting," and greater attention to boat-fittings. What I had foreseen happened: a shift of wind set our floe in motion; the docks broke up, owing to numerous cracks occasioned by the explosions by gunpowder, and a general movement resulted. A polar bear approached the 'North Star,' but her sportsmen, too eager to get the first shot, fired before he was within range, upon which he very wisely withdrew from such uncourteous company.

June 30.—We had succeeded, after much toil, in cutting and blasting through several necks of ice which separated the vessels, and were again collected, when the

wreck of a vessel on the ice was reported from the crow's-nest.* It was then so foggy that we had been groping our way along the floe-edge, in order to prevent the possibility of parting company. On reaching the wreck, which we found to be still suspended with her bow out of water, by her casks and air contained between decks, I caused the vessels to be secured to the ice, and commenced saving all the available firewood, of which we were in need. By bits of papers and brands upon her spars we discovered that she was the 'Regalia,' of Kirkcaldy, and had but recently been abandoned and set on fire. The hacking of her spars, rigging, etc. appear to have been executed by the most malicious feeling of preventing others from making use of them. The fires were still burning, and it was evident that the crew had not long quitted. We sometimes laugh at the rapidity with which wreckers destroy and carry off property; but in a very short space of time the masts, yards, rigging, etc. of the late good ship 'Regalia' were absent, and stowed somewhere on board the five vessels, which "had not room for another cask of provision." As the hull, in its present position, might endanger some other vessel, I determined to let her go down, and, at the same time, relieve her of some of the casks and staves within. This, one of our twenty-pound cylinders of gunpowder very effectively accomplished, strewing the surface of the sea with the remnants of casks, staves, etc. At this moment our men were at dinner; but the noise of the explosion brought them up, and

* "Crow's-nest," a look-out place, about the size of a cask, constructed at the topgallantmast-head, to watch for whales.

from each ship the boats' crews rushed, as eager for spoil as any of our Soolo friends: it was diversion, excitement, or that innate habit of mischief and fun implanted in all seamen, for to them no value could attach to these *spolia opima*. It furnished food for contemplation, of a very mixed character. But a few hours since, such might have been the fate of the 'Resolute,' and, in less time than it takes me to commit this to paper, may be our own!

Whilst thus engaged, the fog cleared off, and discovered a vessel under sail to the westward. About four P.M. the 'St. Andrew,' of Aberdeen, joined, and I there found part of the crew of the 'Regalia,' who informed me, that if we had hove in sight, we could have saved a great part of her bread and provisions, which would have been most valuable. She had been nipped ten days before, the ice passing entirely through her, meeting at the main hatchway, or, as they termed it, "completely toggling her." The master having given up charge, and released the crew from further obedience, each boat-steerer, as customary, took his boat,—and having provisioned her, the crew then broke into the spirits, and, regaling themselves in the cabin, at their highest pitch of intoxication, ordered the skylight to be closed to keep them warm, when the least motion of the ice might have sent them in an instant to their last reckoning! This was succeeded by every wanton act which madmen could commit. A fire was made upon the rudder lying flat under her stern on the ice, and the ship burned until that end of her sank, leaving her floated merely by the air contained in the bow and

empty casks in the fore-hold. We gave the 'St. Andrew' a tow up to the whaling fleet, which we discovered that afternoon, docking in company with thirteen, about ten o'clock that same evening.

The great floe of Melville Bay, where we were now secured, deserves some little notice. Enlivened, as at present, with a forest of masts and animated beings, its wilderness is not sufficiently contemplated. But let the solitary vessel be there imprisoned, and compelled for weeks, without a consort, to anxiously watch every change, night and day, which may afford her the slightest chance of getting into the "north water," and every inspection must impress upon the mind the dreary monotony of that floe! As far as the eye can range, a painfully white, even surface prevails, here and there broken by a huge iceberg; or where mounds of crushed ice or nips present themselves, piles of rubbly irregularities, like huge paving flags, cause the mind to dwell on the stupendous power engaged. The eyes become painfully affected by the glare, particularly when the sun is bright. The icy surface is generally covered with a fine sheet of snow, or, at times, fine comminuted drift ice, which on close inspection will appear to resemble hailstones.

This floe-covered ocean varies in the thickness of its sheet of ice from two to seven feet, and, where pressure has taken effect, is frequently doubled or trebled by alternate flakes pressed under by the meeting of conflicting floes. It is owing to the pressure of hundreds or thousands of acres against the land-fast ice, catching a vessel unprepared by docking, that these fatal "nips" result.

The computation of the floating weight simply of a surface three hundred yards square amounts to 63,080

tons. With even this insignificant floe, impelled by wind or tide against the frail wooden structure of man, what can avail?—something like the Nasmyth hammer on a nut!

If the vessels intended for the whaling trade were built with a more wedge-shaped bottom, the ice in many instances would merely raise them out of water, and allow them to regain their floatation when it eased; but she would not then hold the cargo which gain requires.

Strong, however, as the 'Assistance' is supposed to be to withstand pressure, I much doubt whether we should come off so well in the event of decided "nip" as many of the vessels here. We are deep, heavily laden; they are light, without cargo, would rise easily, and evade the death-gripe, when we should be crushed.

I much fear that my readers will exclaim, "This is merely a book of disasters: another wreck!" But too true; and this time an unfortunate American. On the 6th of July, in one of those animated moves, when every effort is exerted to get ahead and obtain "the lead" through momentary openings in the ice, the 'M'Clellan' barque, being in advance, endeavoured to pass a narrow opening, in order to reach the next "lead." She had nearly succeeded, but the ice, changing its motion, caught her in the narrows, "nipped" and hurt her badly. In a very short time she was deserted by her crew. On this occasion our crews aided, repaired, and left her, as we deemed, all safe, and her crew were induced to return. But hardly were we all secured in docks, and I was congratulating myself in having thus saved the vessel of our ally, when it was reported "that she had experienced a fresh nip, was driven on to the bow of the 'North

Star,' carrying away her cat-head; and that further assistance was required." Commander Pullen further reported, "that he momentarily expected to lose his bowsprit, if further damage did not result."

Fatigued as our crews were, there was no alternative: all the available hands from the Squadron were sent to the 'North Star;' and the master of the American having abandoned his vessel to me, possession was taken, to save stores, protect property, and to prevent any mad action of the wreckers, which might endanger H.M.S. North Star.

It is unnecessary for me to narrate all that was done. I adopted such measures as secured the 'North Star' from injury, saved a considerable quantity of bread from the 'M'Clellan,' and eventually allowed the vessel to go down.

The floe about this period presented a very interesting subject for the painter. Several of the whalers were experiencing very decided pressure from without, and astern of these vessels would be seen the various "flitters," boats, sails, provisions, etc., with the crews idly and unconcernedly awaiting the result. The Americans too had not yet selected their vessels, and were, with their boats and chattels, on the floe, sleeping however on board different vessels.

One fact however, totally unlike the old breed of English seamen, I was ashamed to witness,—the childish apathy, or worse feeling, which seemed to pervade them at the moment when their services were most required, and when their exertions might have determined the safety of their vessels. No danger to themselves presented; yet all subordination appeared to cease, whenever one boat-steerer chose to take *his* boat to the ice.

I mark *his*, because I think it is this vicious *principle* of making the boat *his*,* and joining another vessel with her, that causes all this precipitate abandonment, insubordination, and loss of vessel

In the case of the 'M'Clellan,' the first act of the boat's crew of the 'Regalia,' sheltered by her, was to set the captain at open defiance, and her own crew would not put a finger to the work. I firmly believe that if Her Majesty's ships had not been present, sad outrages would have been committed.

I endeavoured to induce the masters of the whalers present to embark part of her cargo of oil, etc., saved, with salvage allowance; but all refused, declaring that by their law (that of the floe), all that came over their gunwale was the property of the ship. It is on this principle that they destroy their vessels. The oil then floats; they could take it on the sea, but not from wreck. For the provisions, fuel, etc., I agreed that Her Majesty's Government would pay the owners, on production of my receipts.

About the 20th of July, the whalers having come to the resolution of going south, and not losing more time in trying the uncertainty of Melville Bay, or gaining the "north water" by this route, our letter-bag was despatched by the 'True-love.'

On the 21st, they gradually stole away, leaving us in quiet possession, the 'Alexander' alone determining to stick by us, and to take our latest despatches. The feeling was gloomy, but as the separation directed our energies to our own immediate duty, I was not sorry to

* Why not pass a law to make it *piracy* to take a boat without the master's signature and full consent?

be alone: indeed the companionship and ship-visiting did not agree with my notions.'

On the 23rd, the lanes appeared to have been for nearly sixty hours gradually widening; at times the sheets of water broad, and apparently free. Our progress, however, just as we had almost calculated our hours to Beechey Island, became suddenly arrested by fog. The ice also closed in, compelling us to dock; the 'Resolute,' 'North Star,' and 'Intrepid' were lost in fog, but not far distant, as we could hear their return-guns plainly.

July 24.—In 75° 36′ N., 61° 51′ W.—Toiling, towing, and blasting the ice, until eight P.M., when we made fast for the night; about midnight, on the fog clearing off, we discovered the other vessels, about four miles distant to the southward. Being now so far asunder, and the chances of their taking a different lead probable, I made the several rendezvous, pointing out Capes York and Dudley Digges as the two first.

July 25, *Sunday*.—Quiet as any Sunday could be wished; we distinctly heard the bells of our consorts over the ice, and, having measured base by guns, found the 'Resolute' to be four miles distant.

On the 27th, about midnight, we lost sight of our consorts behind some bergs; they were, at the time, apparently free, and proceeding rapidly by the in-shore lanes. We ran alongside an iceberg, to water from a pool on its summit, effecting our landing on the berg from the foreyard; but the floe threatening to close and press us on the berg, we were compelled to haul off, before we had completed.

The 28th found us moving on cheerily; open water and plenty of room. A bear was discovered on the floe,

to which we gave chase in the gig; the simpleton foolishly took to the water, and gave us a very smart pull; however, poor fellow, he soon discovered that he was not in his element, and sprang upon the first small floe-piece he met, where he took his wounds most courageously, plunging again into the sea to allay the pain. After a very animated chase, and some very bad shots, the balls finding their way to the ship instead of Bruin, he surrendered, turning up suddenly on his back. This was the second killed in Melville Bay, the first by Commander M'Clintock and Lieutenant Meecham, of 'Resolute,' on the 6th instant. This animal, even after a ball had passed through his brain, I was informed by Lieutenant Meecham, was disposed to show fight!

July 29.—Our advance had now become pretty regular, occasionally impeded by sudden meeting of points of floes, but these were soon overcome by blasting. I left the ship today for a short time, with Lieutenant May and Mr. Grove, in pursuit of the rotges, small aquatic birds (*Alca Alle*) about the size of a water-hen. We killed one hundred and fifty; but in the act of picking up the dead birds, a sudden run of the ice took place, at the rate of three knots, driving many of the birds under the sharp ledges of the floe. We killed between five and fifteen at a shot. The ship and 'Pioneer' were temporarily pressed against the floe, but it soon ceased.

On the 30th, we had reached 76° N. and 63° 29′ W., and clearly on the verge of our long-desired "north water:" Cape York was in sight, and, towed by 'Pioneer,' we were pursuing our course merrily, hoping to rejoin our consorts there, not doubting but that they had been more fortunate in getting along the land than ourselves.

CHAPTER III.

Native Dogs.—Red Snow.—Cape Dudley Digges.—Game.—Cape Warrender.—Beechey Island.—Rejoined by Captain Kellett.—Cape Riley.—Find Pieces of Whale.—Parting Ceremonies.—Wellington Channel.—Queen's Channel.—Mount Percy.—Winter Quarters.

July 31.—During the night, we had been making good progress, threading the mazes with facility, although occasionally bewildered by fog; but as the sun gained power, this gradually gave way to a beautifully clear morning, and before eight we were able to distinguish the huts of the natives under Cape York: no traces, northerly or southerly, of our consorts. Running close under the southern side of this high cape, we noticed the sledges driving down to the floe-edge, and, accompanied by Dr. Lyall, I went in the gig to visit them, taking presents of knives, scissors, needles, thread, looking-glasses, saws, beads, etc. It was at this Cape that Captain Ommanney examined for traces of Sir J. Franklin, and brought away the native boy called Erasmus York. I much regretted the absence of the Esquimaux vocabularies, none having been supplied to this Squadron, and therefore was totally unable to make them comprehend that three other large vessels were expected; they betrayed no signs of having

seen them. As to inquiry after E. York, they no doubt considered him sold as a slave, and turned their attention more to the business in prospect. But one old man and a boy met us at the floe-edge, the others, although near, having held aloof, in all probability waiting until they were apprised of the turn of affairs. Our traffic with these people, who were filthy in the extreme, cannot prove interesting. In return for our presents, but more particularly in exchange for a boat-hook and a broken oar, we obtained three very fine and handsome native dogs, not differing a hair in marks or colours from each other, being of an iron-grey, whitish beneath, dark stripe on back and shoulders, and strongly resembling a very dark-coloured Arctic wolf.

I was indeed glad to find that the articles which they preferred were likely to be of such value to them, instead of the trumpery gewgaws usually given to these uncivilized beings. As to looking-glasses, if I for an instant imagined they would reflect their own deformities, and induce them to mend, wash themselves, or to scrape off their filth, I would gladly have bestowed on them all our supply. Of wood they appeared to be greatly in need, and had I been aware of it, before leaving the ship I would have given them some of great value, viz. the staves of the great oil-casks picked up from the wrecks. Each of the sledge-runners I noticed, were constructed of no less than nine pieces of oak, partly staves and heads of casks cleverly sewn together, and probably belonging to some vessel wrecked, or procured from the 'North Star' when she wintered a short distance to the northward in Wolstenholme Sound. They were evidently accustomed to

the visits of English, the boy in particular—a much more intelligent lad than York, and very playful, frequently repeating "Yes, yes." Their tents were pitched on the low ground, under the southern and inner slope of the Cape, which is probably about five hundred feet elevation; but we had seen quite enough of the individuals, not to care about inspecting their habitations, and I had yet to reach the Cape in time to secure observations for time and latitude. On our quitting, several parties joined our friends; and we moved off, directing the ship to proceed towards Cape Dudley Digges, and, if not overtaken by us, there to await my arrival. At the time we landed, eider-duck (*Anas mollissima*), lummes (*Uria Brünnichii*), dovekies (*Uria Grylle*), rotges (*Alca Alle*), gulls, and other sea-birds, were numerous, and the narwhal (*Monodon monoceros*) was sporting in great numbers.

I omitted to observe, that the rotges shot by us appeared to be absolutely gorged with a small deep-red shrimp, which probably renders the flavour of these birds more palatable than those subsisting entirely on fish. And it frequently occurred to me, that the tinted spots in our vicinity, termed red snow, had some connection with these birds, which build their nests in the cliffs immediately overhanging; and the floe, far from this region, was repeatedly noticed as tinged by them, but certainly not of so bright a lake or crimson as that now noticed by us in this locality, which is not given for the habitat by Sir John Ross; nor did we notice it to prevail much between this and Cape Dudley Digges. A supply of both (occurring together) was taken, and preserved for future examination.

The latitude of Cape York was determined to be 73° 53′ 47″ N., and the variation 90° 4′ W.; but we were too late to determine, with any degree of precision, the longitude. It agreed with the observations taken on board. But the coast-line, as placed on the chart, is certainly erroneous, as it makes it *convex;* whereas I plainly saw Cape Dudley Digges, and all the intervening points, in the *concave*, as well as the unnamed island, off, from my position. Several wild flowers, including poppies and saxifrage, were in bloom, and the base of the cliff was well clothed with abundance of long grass.

We regained the ship, about three miles to the northward of Cape York, and had full time leisurely to examine the coast with our glasses, as we were slowly towed by the 'Pioneer.' Where Beverly Cliffs may be, I know not; but no crimson snow now marks the spot.

Towards midnight, we neared Cape Dudley Digges; and as this was the second rendezvous, I landed to erect my beacon, leaving instructions to Captain Kellett to follow to Cape Warrender. It was a cold and dreary job, and, but for the noise of the disturbed birds, which have their nests here, might be pronounced awfully solemn. It was very difficult to find any position on the profile of such a vertical bluff which would conspicuously exhibit my mark; by dint however of scrambling, we found a ledge well suited to the purpose, on which a whitewashed cask was placed, and filled with stones, our cylinder being suspended within reach from a lower level. This completed, I was not sorry to regain my boat, and find myself, after twenty hours' exertion, on my way to my nest. Some few lummes and dovekies

were added to the larder, and a very fine burgomaster (*Larus glaucus*) was winged, but he fluttered so far to leeward that pursuit was not warrantable.

Cape Dudley Digges is a high beetling bluff, elevated about eight hundred feet above the sea, and of a porphyritic character. About five miles north-west from it is a high-peaked unnamed island, termed by some of our men—not inaptly—Desolation Island. Off this I rejoined the ship, which, by the reckoning, would place this island north-west five miles from Cape Dudley Digges. I cannot imagine that our consorts have passed, or some sign would have been left.

Before taking leave of this region of birds, I would wish to record my observations upon the probability of Sir John Franklin seriously thinking of laying in any supply. It is not improbable that they did so for private purposes, or for the use of the sick. But any man traversing latitudes within the Arctic Circle, will be perfectly aware that no salting process would be necessary, where nature takes much more efficacious means, by reason of low temperature.

They are not so easily killed, or taken when wounded, as some may be led to believe; and with four double-barrelled guns, in one hour, but a hundred and fifty were captured, and yet they *swarmed*. But I very much doubt any one killing them with peas, certainly not with "split peas," with which I think Sir John Franklin's and other Arctic vessels were supplied. Nor would any rational person so wilfully throw away "pearls after swine," when abundance of shot was provided by the Government.

But wishing to determine, in the distribution of birds

killed on service, what would be deemed a fair equivalent as compared with meat, I directed a committee to report thereon. The result was, that twelve of these birds (*Alca Alle*) were not deemed more than adequate to one pound of meat. This, then, reduces the question to one of numbers: $12 \times 90 = 1080$ per diem would be required, to afford the crews of the ship and tender with one meal. It is my conviction that, taking a boat's crew, or even two, of our picked men, fit to be trusted with sporting, this number would not be taken in one day, and the opportunity never probably to be repeated. But a much more important matter hinges on it. His vessels, we know from the letters received, were fearfully hampered with coal and provision. Where were they to stow some hundreds of thousands? Moreover it is too doubtful an experiment to try upon a crew, situated as he was, to force them, before necessity rendered it prudent, to take a substitute for provision. When birds are issued, it generally is considered in addition, to cheer them, to keep up their spirits; or when game, as deer, musk-ox, etc. can be substituted entirely, or half with half rations, on the march, and where they eat as much as they require, no bad feeling would ensue. But the result in my own ship was, that I did not consider it a safe experiment: it was not necessary, and therefore the birds, when we had killed sufficient, were served out as additional.

August 1.—Lat. 76° 3′ N., long. 70° 46′ W.—Weather very fine; light breeze; the horizon clear, blue, and well-defined, dotted merely here and there with small icebergs; the eye much relieved from the late painful glare of the ice; and the good ship, under canvas and in tow,

gliding smoothly along at the rate of 3·5 knots. After our late dreary confinement in the floe, this was indeed felt as a release,—we breathed freely on our own element. Nothing now was wanting, to complete my satisfaction, but the sight of our consorts, ahead or astern,—the former preferable, as our single steam-tug would soon bring us up with them, at all events, long before we required them in aid of our operations. At this position, I notice that my friend Austin was, on the 14th of August, about ten miles north-north-west of our position; so that we may console ourselves, after all our tedious delay, that we are at least thirteen days in advance of his expedition,—amounting here to nearly half a season.

Notwithstanding much was advanced against the propriety of our early departure from England, I now feel fully satisfied that we were still as late as could be ventured. We have gained greatly in strength, in aptitude for ice-service, and generally better acclimated than if we had made the most rapid progress from the mouth of the Thames to Beechey Island. There are also many minor, but very important considerations, to which it is unnecessary to revert, relating principally to the general health of the crews, of which my mind has been but lately relieved; and this delay has considerably enhanced the value of some individuals, who might otherwise have been deemed fit subjects to be sent home. But we are now in full vigour, ready for any service, and in good training.

On the 2nd of August we had reached the lat. 75° 5′ N., and long. 73° 21′ W., and but few spots of ice visible. These steamers are certainly better than *nothing*, but are unable to tow us more than three and a half knots, under

every assistance of canvas; and at very critical moments, owing to want of power, are under our bows, or possibly foul the towing hawser. Vessels for this service should be independent screw steamers, accompanied by the ships as transports or depôt vessels. The officer commanding should be in the steamer. Hailing and straining the lungs to people always half deaf, is not pleasant to either party, and is productive, by repetition of orders, when not heard or not obeyed, of very unpleasant feelings. Towards the evening, the breeze having freshened considerably, reducing us to close-reefed topsails, we cast off the tow-rope; motion quick and unpleasant, and ship dropping away to leeward very fast.

On the 4th we were again enabled to make all sail, but found we had been driven, by current, to the southward of the entrance of Lancaster Sound, making Cape Walter Bathurst, in lat. 72° 19′, long. 76° 20′ W. It is needless to dwell on our misfortunes, or the time taken to recover ground; I shall therefore assume my position off Cape Warrender, on the 7th, whence I despatched Commander Richards to the Cape, to examine for records, and sent the 'Pioneer' off to Navy Board Inlet, to report upon the coal and provision deposited there by the 'North Star.' At Cape Warrender Commander Richards left my despatch for the Admiralty, as well as one for Captain Kellett, but could not find the document left by Captain Ommanney. The label of the cylinder, with "Pull out," was found,—apparently intelligible to foxes, as the impression of their teeth was unmistakable. There is, however, from later intelligence from Commander Inglefield, strong ground for believing that not only

this, but my despatches deposited there, were carried off by Esquimaux, whom he met with at Dundas Harbour, a little to the northward, in the summer of 1853.

Captain Kellett evidently had not called here, or he would have left some intelligence. Our progress, unaided by the 'Pioneer,' and contending with adverse wind and tides, was very slow. The weather was beautifully fine, and we anxiously looked out for the return of the 'Pioneer,' whose absence was now very protracted. We had too much spare time to admire the extraordinary singularity of the entire land composing the northern side of Lancaster Sound. One very impressive idea is almost forced upon the senses, and that is, that one line has been common to the entire summits, and at one period the surface must have been continuous, exhibiting an immense surface of table-land, and this, the original feature, was probably level with the ocean; that, either at its up-heaving, or on the subsidence of the waters, it left parallel terraces for hundreds of miles, and the escape of the water channelled deep ravines, or scooped out deep bays, constituting the present castellated eminences. Subsequently, I am led to add—Nor is it to the eye alone, as viewed from the deck of the passing ship, that these ideas are solely formed; it will be noticed hereafter, that a similar course of structure, similar rocks, fossils, etc., pervade this strange region, even to the extreme exploration north of this parallel. By dint of standing close in-shore, and watching every change of tide or wind, we had just gained a position to enable us to "lie up" for Beechey Island, and the breeze continued to favour us, when our curiosity was excited by report from the crow's-nest of a stranger

in the direction of Leopold Island. Many were the conjectures; for under some aspect, totally inexplicable to us, did this stranger present herself distorted by mirage. The *black pendant* soon informed us of her moving power, but the 'Pioneer' it was not; our suspense was not of long duration, for the 'Intrepid' made her pendant, and soon took us in tow, when I learned that our consorts had reached Beechey Island, and not having called at our places of rendezvous, the 'Intrepid' had been sent to look for us.

August 11.—On the morning of the 11th, intending to visit the cairns *en route*, by pulling ahead in the gig, I went on board the 'Intrepid;' but almost at the same instant, noticed a large bear about to visit the very cairn to which I was proceeding. A very short signal to the ship sent her sportsmen to my aid; and landing full in front of the cairn, whilst the officers took it in flank, Bruin came down to meet me, and was duly complimented by both barrels. He scattered along in-shore, and fell under the accumulated wounds of those who met him in retreat. This animal was towed on board, weighed 757 lbs., and measured eight feet seven inches from snout to tail. Having examined the records left at Cape Hurd by Captain Austin and the American Expedition, we moved forward; however, adventures never happen singly. Shortly after noon two walruses were noticed on a floe-piece in our course, and the harpoon-gun put into requisition. The effect was beautiful; passing the harpoon through the monster, and that without leaving him power to get off the floe: it was a dead shot. His companion made a great fuss about it, was treated

with several balls, but eventually retired. This, added to the bear, became a most valuable acquisition to our dogs' food, which had now become very nearly expended.

Shortly after five P.M. we sighted the 'Resolute' and 'North Star,' secured to the floe under Beechey Island, and before seven the 'Assistance' was also fast beside them. When Captain Kellett came on board, to report proceedings since our separation, I found that he had reached Cape York, and communicated with the natives, on the day after, or the night succeeding, my visit, but had not the slightest intimation of their having been visited by us; and strange enough, he saw the boat-hook which I had presented to them. As he did not call at Cape York, Cape Dudley Digges, or Cape Warrender, he had not met with my notices, nor knew of my having passed those stations.

On the 12th August, accompanied by Captain Kellett, and also by an official party under Commander Richards, a close search was made of every likely spot on Beechey Island, but without discovery of further traces. The graves were dug into, but found so firmly frozen that no prospect offered by further disturbance; they were therefore replaced, and completed anew. Upon viewing the spot carefully, I was strongly of opinion that the ships under Sir J. Franklin did not winter on the southern side of Beechey Island, but were in Union Bay. Upon a very careful review of the ground, there are several points, which must have occurred to Sir John Franklin and his talented seconds, which, in my mind, would have prevented them from selecting the southern bay. In the first place, it was at once the opinion of Captain Kellett,

Commander Pullen, and myself, that Erebus and Terror Bay was not a safe position for the 'North Star,' and we determined to seek a better, if possible. Next, if the 'North Star' should have to "cut in," there would be great doubt of her getting out until very late in August, or by the 1st of September. This could not suit the views of Sir John Franklin. With Union Bay the case is quite different, and the ice may be cut or blasted, by watching convenient moments. For two seasons we know that it was free; and now it is all but clearing out, any aid would send it forth; but great labour would be required to cut in or out, to where the 'Erebus' and 'Terror' were supposed to have been. Sir James Ross landed the 'Mary' yacht on the beach of Union Bay, when Erebus and Terror Bay was as fast as at present. But the most convincing evidence to my senses is, the drift-lines of oakum, chips, etc. on the southern bend of Union Bay. I found also in the washhouse (so termed), but which I consider more likely to have been an hospital, similar threads of oakum from the seams of some vessel, with the pitch adhering; but on the curvature on the inner, or Erebus and Terror Bay, no drift whatever was noticed. Everything at the Point indicated that to be nearest to the ships,—the pile of preserved meattins, the garden, etc. No direction-posts were noticed but on the north and south lines of Union Bay. All operations discovered are on that coast,—nothing on Beechey Island, excepting the sheltered spot for forge and workshops. So perfectly convinced did I feel upon this matter, that whilst we were examining the drift on the beach, I observed, "Well, let us send two hands across

the ice, to meet us at the point where we strike the bay, and direct them to search the intervening beach for drift-wood." On reaching the spot (the north bend of Union Bay), I found two pieces, one Canada, the other English elm. The men had found nothing.

Proceeding on, we visited the 'Mary,' left by Rear-Admiral Sir J. Ross, and, having taken an inventory of her contents, moved on to ascend Cape Spencer, hoping from thence to obtain some insight into Wellington Channel; but in this we were disappointed, the higher land in rear intervening. We examined the notices, rebuilt the cairn of double dimensions, and returned, somewhat fatigued by one day's labour. I had despatched Commander M'Clintock, in the 'Intrepid,' to report upon the state of the ice in Wellington Channel; but the reports of all the visitors to the leading headlands, which afforded any views up the channel, were rather adverse to open water; some even fancied they saw the icy barrier across the straits.

Today, the 13th, we devoted to the examination of Cape Riley and Gascoigne Bay, accompanied by Captains Kellett and Pullen. We first proceeded to Cape Riley: the result of our search afforded no clue. The circles of stones were clearly those of Esquimaux. The huts had not been temporary habitations; each was perfectly paved, as in regular settlements, and, as is customary with these peculiar people, the slabs had been brought from some distance, as the fragments under the fallen cliff were abrupt, rhomboidal masses, but these were selected tabular slabs, particularly at the graves, misnamed fireplaces. The same loose stones, used by the Esquimaux to steady their tents, might have been used by

Franklin's people. I very much regret that the articles had not been found by us. I am not presumptuous enough to fancy I know more than others, but there is a sort of freemasonry in men accustomed to distress, which enables them to read the movements of others, induced by the recollection of what they have themselves practised. Such a feeling has ever remained fixed in my mind; but several important questions arise. What tents do we know of having *bolt-ropes?* Why would they cut them off? But, on the other hand, I have had to cut up my sails, to make sandals for my men! Again, for what use was that rake? Not to take objects of natural history, but to detach the edible fuci, which my men and officers have repeatedly seen me seek, and eat with satisfaction. The inner low-water beach and rocks, immediately under the point at Cape Riley, furnish this fucus (dulse).

Captains Kellett, Pullen, and myself have had some little practice in magnetic observations, and we were unanimously of opinion that this station never was selected for such service, or, if so, very injudiciously, as the vertical mass of mountains overhanging would prejudice any results obtained. In plain terms, I believe that some accident occurred there; and possibly they had to cross the bay, to regain the ships, if they were there. Another argument against tents is, that they are supplied by the Ordnance, are not of *canvas,* and could not have the service-mark in their *four-stranded* cords or lines.

This then must still remain clouded in mystery. Another consideration forces itself on the minds of men who work in these temperatures—At what season would they propose to make their magnetic observations? Not at all

probable in August, when Franklin would be bound up Wellington Channel, or homeward; and only in August, or later, when thaw had removed the ice, would we find men groping, with savage adaptation of rakes, in searching the bottom for objects of natural history: one of three objects only placed them there—game, amusement, or distress; I fear the latter. I cannot, painful as the conclusion is, divest myself of the feelings which were impressed on my mind on searching that so-called wash-house. The indelible features of a catastrophe were there: painted canvas, panels, mouldings, oakum from the side-seams of a vessel (wide seams too), pill-boxes, surgeons' phials, rags,—all indicated a house of shelter or hospital; moreover the internal inclination was falling to the centre, as if the casks had formed the side barriers, and the sleepers had slept with their feet towards the common fire. Now, taking into consideration the earliest moment that the ships would embark observatory tents, and with *tent-pegs*, any ground into which they were driven would yield them easily in June, July, and August. I ask, what hurry? And again, in colder months, what would they be employed about in tents? and then, whence the confusion? They could not get out in July. Indeed every suggestion of *hurry* is absolutely untenable. A collection of the articles found was piled up, and ordered to be preserved, and unfortunately was not attended to; for, to my mind, the most important article, the oakum from the seams, was lost.*

* These remarks were penned in August, 1852. I see no reason to alter my opinion now, in 1855: I still believe that position to mark a disaster.

However, I shall now dismiss this subject with Cape Riley. Fossils abound there, particularly fine specimens of the lily encrinite, but the operation was too laborious to procure any connected specimens, the rock splitting to pieces under the slightest concussion.

Moving on towards Gascoigne Inlet, we noticed a bear in distress, that is, puzzled, not knowing how to proceed without confronting us. They are not courageous beasts, and fly from man, if escape is ever open; but this poor unfortunate gentleman was perched at the top of a steep *débris chute*, which had a steeply inclined corresponding glacier on its left. There he stood, as we suddenly came upon him, and most uneasy were his movements,—he paced his quarter-deck in agony. Captain Kellett and myself landed; we both fired from below, and wounded him; I then ascended by the *débris*, backed by my boat's crew, with boat-hooks, etc., and got upon his level, when one ball settled his fate. Poor stupid creature!—never call them cunning more! His den was beneath him, under this glacier, where he might have snugly ensconced himself and laughed at us; and into this refuge did he now try to crawl, as he received his death-wound. We should have been glad of the aid of Gordon Cumming to extricate this monster, as it was no easy matter to pull him out by the hair of his hinder extremities; however, having got hold of one hind leg, he was soon gliding down the face of the glacier, faster than on any "montagne Russe," leaving us very little trouble to get him over the remaining ice into the boat.

Our examination of Gascoigne Bay did not prove satisfactory. There was not sufficient depth of water for the

'North Star' to lie secure, even at its mouth; no shelter from the ice of the strait; and, from the thinness of the floe, it would inevitably break up with the first breeze, leaving her quite exposed to the driving pack. It was therefore decided to cut into Erebus and Terror Bay, where very strong ice still prevailed, notwithstanding some of its outer lines were constantly breaking away. As we neared our ships, I noticed that something unusual was taking place, as the mollymoks and gulls were dashing at pieces of floating matter, with which they were gorging themselves in a most excited manner. I determined therefore to ascertain the object of so much contention, and, much to my astonishment, found the floating pieces to be the outer (or blubber) parts of the white whale, cut into pieces of eighteen inches to two feet square, and evidently by some sharp instrument. Two pieces were taken on board, to be reported on by the ice-quartermasters (whaling-mates), who pronounced them "to have been cut by some sharp instrument, and that they were *recent* and sound." I could therefore only attribute them to some visit of the 'Prince Albert.'*

The 'Pioneer' having returned, and Lieutenant Osborn reporting that he had been unable to find the provisions at Navy Board Inlet, every effort was made to complete her coal from the 'North Star' that evening.

On the afternoon of the 14th of August the 'Intrepid' also returned, her Commander reporting "open water as far as he had been able to examine, but patches of ice in several directions in our route." The leading officers dined with me, and after reading over the several instructions

* This question has never been cleared up.

for their guidance during our separation, our despatches and last letter-bags for home were closed, and delivered to Commander Pullen, in the hope that the 'Prince Albert' might stray this way on her homeward passage. And now a very painful and exciting duty remained to be performed. The crews of the Squadron having been collected under the Union, on the floe, were addressed on their several duties. The beautiful prayer composed by the Rev. H. Lindsay, for the commencement of travelling, was read, and a copy distributed to each person. After many and some very warm expressions and pressures of the hand, we parted to our several duties, Captain Kellett remaining with me to the last; for in such a service there are many last explanations. But on one point a most fervent determination, "God willing," was exchanged, "to communicate in 77° N. and 105° W." About eleven P.M., all our arrangements being complete, I took leave of my companions; and as they passed over the side, the order "Let go the warps" was issued. Towed by the 'Pioneer,' we slowly moved forward, cheering and cheered, until the island intercepted further communication.

We were now entering the threshold of the contested Wellington Channel. Anxiety, deep anxiety, oppressed me; it was unmixed with doubt,—rather the reverse. Through that channel my course lay. If any explanation of my feelings could have been reached, possibly it was nearer to gratitude that Providence had enabled me to be the humble instrument by whom it was to be explored.

By midnight our entrance, to my mind, was no longer doubtful: no trace of opposition,—the clear, deep blue

sea, visible to the horizon, was before us, and, reflected in the heavens beyond, the well-known "water sky" afforded us the cheering hope of passing the Rubicon, the icy barrier of Penny, at Cape Osborne. Every foot advanced raised emotions not to be explained, and the telescope had but little rest, so eagerly did we scan every feature of the surrounding coast-line.

On the morning of the 15th, a small cairn was noticed on a point a little ahead; I quitted the ship in the gig to examine it; it was Cape Grinnell, but no record remained. White whales were sporting very unconcernedly in the brisk tide which, near the Cape, flowed to the southward, but the ship evidently moved rapidly to the northward; this, probably, was merely an in-shore eddy current. How the imaginations of the croakers had conjured up the "barrier of ice," I am totally at a loss to conceive, for here not a particle of ice, to be seen from the land, about eighty feet above the level, could warrant an idea of obstruction.

Passing Cape Osborne about noon, we entered on the chord of Baring Bay, apparently but a slight indentation, and free from ice. Our attention was specially directed to this part of the channel, fully expecting to discover some inlet, stream, or lake, which might afford Mr. M'Cormick some chance of discovering "a lead" into Jones's Sound, but in vain; nor could we find any mountain, hill, or elevation, to correspond with the Mount Franklin of De Haven. Before evening, all fears of barriers had vanished, and our course westerly and northerly was still clear from the mast-head.

About two A.M. on the 16th, we shoaled our water to

thirteen fathoms off a low point of Nobody's Bay on the charts—(there are no less than five of these, merely *bends*, not *bays*, between Cape Hogarth and Cape Osborne); and very shortly after this, the water continuing to shoal gradually, a very conspicuous cairn inland was reported. Before this I had been reposing on my sofa, but this allowed of no further hesitation: with every power of telescope I scanned the pile, and the more I gazed, the more mysterious still it appeared. It was too large for any ordinary cairn, and yet I thought that its regularity could not be mistaken: at one time it appeared to be the remains of a stone house, the chimney-stack alone remaining,—possibly a column of masonry, and the work of man! Under such feelings, leaving the ship to proceed under sail, and casting off the tow-rope, I put myself on board the 'Pioneer,' and proceeded to solve the question, taking with me instruments and chronometer, in order to fix its position. The 'Pioneer' grounding about a mile off shore, I landed on the beach close beneath it; and it being then low water, by the shore, I well knew that she would soon float off. On reaching this remarkable pile, I found it to be one of Nature's freaks. It was apparently the remains of a limestone conglomerate, or dyke, the surrounding rock being tabular, slaty, magnesian limestone, of a much firmer and compact nature, on which the snow or ice acted more directly. However, the looser rocks had fallen away, leaving this pyramidal column standing; its base was twelve feet by six, height twenty feet.

A white hare noticed us, and kept performing most suspicious circles round us, frequently presenting herself



E.H. del. Vincent Brooks, Lith.

Extraordinary Dyke, Point Hogarth

at the opposite point from whicl. she had vanished. Dr. Lyall, who accompanied me, used every endeavour to take her, but she never permitted him to get within range. I once came suddenly upon her, but, not having my gun in hand, she escaped. The determination of this position proved it to be the rise of Point Hogarth, and yet none of Captain Penny's travellers noticed this obelisk! It is situated in lat. 76° 12′ 52″ N., long. 92° 48′ 42″ W., the variation 146° 11′ 51″ W.; a most unmistakable eminence, to which I have given the name of Lyall Bluff, is almost immediately adjacent. The terraced levels were strewed with bivalves, chiefly of the *Mya* tribe. As an example of the notices deposited at each cairn visited by any exploring officer, I beg here to add the one left at this station; they were printed forms, filled in by the officer in command of each party.

Arctic Searching Expedition, under the Command of Captain Sir Edward Belcher, C.B.

DIRECTION.

Ships.—'Assistance;' Tender, 'Pioneer.' Wellington Channel.
„ 'Resolute' (H. Kellett); Tender, 'Intrepid.' Melville Island Lane.

Depôt or General Rendezvous.—'North Star,' Beechey Island.

Left Beechey Island, Saturday, 14th August, 1852, at ten P.M.

Proceeding towards Sir Robert Inglis Bay, westerly.

Day.—Monday: date, August 16, 1852: time, three P.M.

Condition.—All well.

Remarks.—Landed, believing the remarkable stone pillar, inland, to be a cairn erected by human hands. Observed for latitude, longitude, and variation, and to correct chart.

EDWARD BELCHER, Captain,
Officer in Charge.

The day was really entitled to the appellation of lovely;

it was serene and balmy for this climate. Having rejoined the 'Pioneer,' we overtook the ship to the eastward of Cape Majendie, and mistaking it for Cape Becher, on which I determined to land a *cache*, despatched Commander Richards and the master to execute this duty about eleven P.M. The *cache* consisted of forty-two days' rations for ten men, or four hundred and twenty rations, and was intended to relieve our parties who might have to travel back with despatches. About two A.M. our boats returned. The tide running strong to the eastward, prevented our getting much beyond Cape Becher before I gained the deck in the morning, so that, as we progressed, I had the full advantage of scanning the entire coast-line. To the southward, I noticed a shoal islet, not on the chart, and some very remarkable capped table mountains, in a northern deep indentation, to which I gave the name of Barrow Bay, and to the conspicuous little detached table mount, John Barrow Head; saw the islands Parker and Barrow, of Penny, and noticed that any points he might have seen were but the outer spits of several islands covering each other and flanking the northern shore. As to the geography of the place, we were sailing over a great deal of *hard land* of the published charts, without injury to the 'Pioneer' or ourselves! Moving on rapidly under sail and steam, I asked myself the plain question, "Would Sir John Franklin, under such circumstances, stop here to erect a cairn, with the sea open before him?" I exclaimed to myself, No! and, tainted with some such prejudice, and with such a breeze thinking it would be sinful, on we went. But there is an end to all things,

and so, having reached the end of the far-famed Queen's Channel on this side, and our progress impeded, I thought that some beacon should designate the turning; and further, as it had now become necessary to seek for our next course, I determined on ascending the mount, the base of which I have retained as Cape Sir John Franklin, from whence I obtained a most commanding view of land and ice from north to west and round to the south. But unfortunately, what we little dreamt of when we commenced our ascent of this mountain, was clearly exhibited to our senses, for ten miles beyond the base of our position, an ominous icy barrier prevented further progress westerly! The only chance which seemed to offer was by taking the north, through the inside passage, which yet remained to be examined. Beneath us lay a magnificent sound, hemmed in by two great islands, and until Nature was inclined again to favour us, there we must await her pleasure. To this elevated position I gave the name of Mount Percy, taking possession, in due form, for Her Most Gracious Majesty Queen Victoria; and to the sound beneath, that of Northumberland Sound, in honour of Her Majesty's Minister, the noble Duke presiding over the Board of Admiralty.

Descending in somewhat diminished spirits, I rejoined the 'Pioneer,' recalled the ship, which was fast dropping down into the ice, and succeeded most happily, as things turned out, in securing her that night in safe quarters.

Numbering our particular events, I term the passage of the Queen's Channel No. 1 fortunate. That of securing the ship before she fell into the jaws of that ice, No. 2; for most assuredly her timbers, unless she drifted back in

the direction of the strait by which she entered, and had contrived to reach Barrow's or Sir Robert Inglis's Bays, never would have repassed Beechey Island (if they ever do, as it is). From the summit of Mount Percy, Cape Becher is shut out, and Baillie Hamilton Island not definable. The Point to which Captain Penny has given the name of Sir J. Franklin, is the point of Long Island, twelve miles southerly, covering Barrow Bay; but as it was manifestly intended by Government that the names of Sir John and Lady Franklin should occupy the limiting points of the Queen's Channel, I have removed them there.

From this point our new world commences; and as I have taken such liberties with Sir F. Baring Bay on my passage up, I think I cannot better place his name, than by giving him the great bight within us, easterly. I have not interfered with any of the points southerly, as named by Captain Penny, but the islands will take appropriate names as may be hereafter assigned to them.

August 18.—Our measures were not taken an instant too soon; hardly were we secured in Northumberland Sound, than the ice began to threaten, and it soon became evident that we must select more secure quarters. However, before the ice had made any breach into our snug position, I ran over with the 'Pioneer' to the northern remarkable island, and from its summit I soon perceived that, for the present, all progress by ship must be stayed. I had also sent Commander Richards to another higher mount, so that our motions, at all events, by ship, boats, or sledges, should be based on some fixed positions. The view from the pinnacle of the island,

which has been temporarily termed Pioneer Island, was truly cheering. To the north and easterly, islands and land as far as the telescope could see. Nothing but ice occupied the arc of the horizon from north to west-south-west. There lay the Arctic Ocean; Cape Lady Franklin, at least our newly-named cape, appeared to bound the southern shore, but the loom of land was evidently visible further to the southward and westward. On my return to the ship, Commander Richards informed me that he thought a very complete little harbour would admit the ship on the opposite side of the Sound. It was found, however, to be unfortunately barred by a ledge of gravel, having only twelve feet; but immediately outside and behind it Nature appeared to have thrown out a rocky spit, which would afford us shelter within, and at the same time be at the line of open water, should occasion require any immediate removal. Into this, as our other position was in very deep water (thirty-six fathoms), and much exposed, we were accordingly transferred, and, as events proved, not an hour too soon. From that spot the ship never moved, nor could have been moved, for any sensible purpose that season! Nor was it possible, had such been the command of their Lordships, to have moved any vessel westerly of that position; moreover, had such been practicable, no man in his senses, having a discretionary power vested in his hands, would disgrace his trust by any such mad attempt, when the special object contemplated by this Expedition could be much better achieved by boat or sledge travelling.

CHAPTER IV.

Frozen in.—Sledge Travelling.—Walrus Shot.—Habits of the Walrus.—Village Point.—Esquimaux Hut.—Deceived by Mirage.—Tent Equipage.—The Sentinel.—Ice Accumulations.—An Intruder.—Exmouth Island.—Rejoining of the Party.—Nip and Piling Ice.—Quit Exmouth Island.—North Cornwall.

The position which we had taken up will be best understood from the small plan of Northumberland Sound, of which a very rapid survey was made during the progress of feeling our way, preparatory to more decided exploration.

Our anchorage, although very nearly land-locked, was very capacious, and afforded great scope for heavy masses of ice to play their pranks. But I consider our principal safeguard from any such visitation consisted in the tidal stream, which set directly parallel to the chord of the bay between our outer point of the peninsula and the opposite southern horn of the bay; and the motion of the ice from the westward would be further impeded by a long shoal islet, stretching well out to the northward of the great island, and flanked by a smaller one within, on which they all appeared to expend their impetus. The outer point of the peninsula (called Mount Beaufort) was

PLAN
OF
NORTHUMBERLAND SOUND
PRINCE ALBERT ISLAND
by
CAPTN SIR EDWD BELCHER
POSTS OF WINTER QUARTERS
Lat. 77°32' Long 97°W.
1852-3.

Scale of Miles 0 1 2

Osborne Pt
Stafford Mt
Village Bay
Russell Island
Britannia Mt
Hornby Island
Spit point
Wilson Cove
Fitz Roy Mt
McBeauvert
Winter Quarters 1852/3
Douglas Mt
Kate Island
NORTHUMBERLAND
Herbert Island
Longe Pt
SOUND
Hawker Bay
Milne Island
Ryde Parker Pt
Pt Gifford
Hawker Mt
Pownall Pt
C Sure
Pelham Bay
Gold Creek
Blanche Mt
C Sir J Franklin
Mt Percy
Strait
Barings
Baring Bay

London Published by Lovell Reeve 5 Henrietta Street Covent Garden.

Engraved by J & C Walker

our first protection, and the ledge off the intermediate rounding angle our perfect guard.

With a rapidity not at all understood, we became suddenly frozen in, and at a period too when previous navigators would have led us to believe that the ice might "break up" for the season. What impressed me with the conviction that the present occurrence was decisive against further motion, I cannot conceive, nor did I wait to inquire. I had seen enough to instruct me that decision only would enable me to save the remaining part of the season, and, if properly employed, would make a great extent of the northern land, estimated as forty miles distant, British territory.

August 20.—About midnight on the 19-20th, the 'Assistance' ceased her travels for the season. On the 23rd, at 7.30 A.M., three sledges and one boat moved out fully equipped, from the 'Assistance.' The Hamilton boat and Londesborough sledge—the Captain, and Mr. Loney, master. Second sledge—Commander Richards, and Mr. Grove, mate. Third sledge—Lieutenant Osborn and Dr. Lyall. The party consisted of twenty-seven persons, and carried twenty-one days' provision.

A short space was navigable, to which the other boats aided us, but quitted on reaching the outer floe under three hearty cheers. At starting, the 'Hamilton' alone was available for crossing the lanes of water, but this so much retarded us that Commander Richards returned for one of the whale-boats. We had then advanced about three miles. On one occasion we enlisted the services of a piece of loose ice, on which a sledge and crew complete were, by our united sounding-lines, warped across

safely. But it was not a little amusing to watch the countenances of some of the party ferried,—more doubt than confidence prevailing. Here we encamped until Commander Richards returned, or until the following morning, during which time I succeeded in shooting four walrus, two of which I was enabled to secure, but, Dyak fashion, their heads only were at this time taken. During our absence on this journey one of the beheaded carcases floated near the ship on the floe-piece where I had left him, and was captured, but not, I believe, without further expenditure of ammunition: of this I have no particular evidence: he had no head to speak for himself, and no such trophy was produced. It is not pleasant to narrate acts which bear the impress of cruelty, and I must confess that, on reflection, the killing of four of these animals, without securing them for use, was unnecessary: the sportsman seldom thinks of this. The death of monkeys or parrots, and turtle, where they could not be consumed, has often brought me to the same reflection. But without dwelling further on acts or motives, the duty of naturalist compels me to notice the conduct of these warm-blooded animals on being wounded. The father, mother, and cubs were of the party. On the death of the mother, or rather on receiving her wound in the neck; it was painfully interesting to notice the action of her young: one literally clasped her round the neck, and was apparently endeavouring to aid in staunching the blood with its mouth or flipper, when at a sudden convulsive pang she struck at her infant with her tusks, and repeating this several times with some severity, prevented its further repetition. The male, with a very white



E.B. del. Vincent Brooks Lith.

Novel Ferry

beard (strong horny bristles), came up repeatedly in a most threatening attitude, snorting aloud his vengeance; and well satisfied was I that the floe was my safeguard: doubtless he would have wreaked his vengeance on the 'Hamilton,' and we should have met our punishment! Another, finding that she could not longer swim, deliberately hauled herself up on the floe to die. Now with all due deference to anatomists, who may afford us full proofs of the capability of these animals to walk like flies on our ceilings, I must protest, from frequent observation, against the use of the flipper of the walrus for this purpose. It does not appear to be of greater aid than that of the seal is to that animal; and, strangely, its nails are placed on the upper side of the flipper, some inches within its margin. That the power of exerting the vacuum exists, I doubt not. But here, within a few feet, deliberately did I watch the progress of the animal in effecting its purpose. In the first place, the tail and fins, exerting their full power in the water, gave such an impetus, that it projected about one-third of the body of the animal on to the floe. It then dug its tusks with such terrific force into the ice that I feared for its brain, and, leech-like, hauled itself forward by the enormous muscular power of the neck, repeating the operation until it was secure. The force with which the tusks were struck into the ice appeared not only sufficient to break them, but the concussion was so heavy, that I was surprised that any brain could bear it. Can any one then be surprised, when they are informed, that they "die hard," even when shot through the brain?

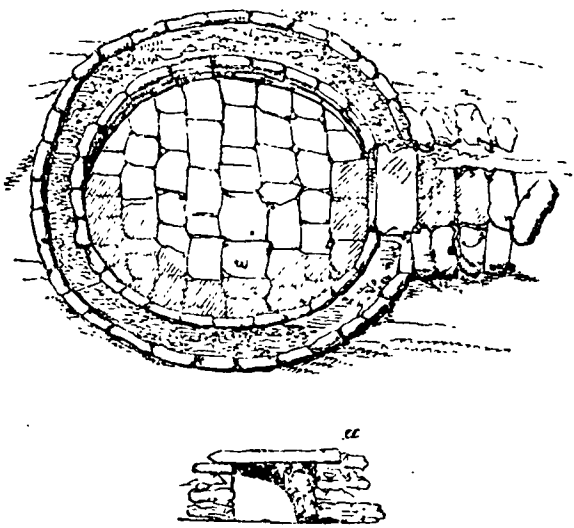
As the 'Hamilton,' our sledge-boat, will frequently

occupy a very conspicuous position in this narrative, I may as well explain that four of these boats were supplied for light ice-travelling, built of canvas and very thin board cemented together, and weighing three hundred pounds. A model of a Norway boat having very kindly been lent to me by Captain Hamilton, the Secretary of the Admiralty, these boats were a modification, improved as the four were successively in progress of building; this, being the last, I selected, and named her after my kind friend. She might be termed a brown-paper boat, but did her duty well with those who knew how to manage her.

As Commander Richards would have much further delay, and my operations could progress without him, I pushed on for the low point in sight, being the extreme seen from Mount Percy. Here we constructed a very large cairn, composed principally of the remains of an Esquimaux encampment, and which gained for the station the name of "Village Point." This village, or encampment, was of the most substantial construction, and from the remains of bones, etc., not of such great antiquity as travellers in these regions are in the habit of assigning. Great ingenuity and labour had been exerted in their construction. They were not superficial, but their foundations were laid at least three feet below the ground,—a matter most difficult to execute, even with our tools, at any season! These foundations were of stone, in double walls, with the interval filled in with fine clay and gravel. The doors faced to the east, and evidently had the long passages usually appertaining to those of settled habitations in Greenland. Further, as noticed at

Cape Riley, all the stones were larger, and different from any others noticed on the Point.*

The general form of these houses was that of an oblong oval, about ten feet by twelve, having the doorway about three feet wide by two feet six inches in height, on the floor-level, descending easterly to the external adit.



One from which this sketch may be said to have been taken had the flat stone remaining over the doorway, as at *a*. When I venture the observation *recent*, I wish to be understood as having then, on the spot, asserted such to be my belief, irrespective of later discoveries; and I felt satisfied, from general observation of the operations of nature during a season, on stone and other substances, in these latitudes, that no such long period as "hundreds

* None were seen but those of which the houses were constructed.

of years" could be assigned to them. I have studied this matter lately with some interest. I have dug in the grave-circles (not fireplaces, for they do not contain a trace of fuel); have noticed the bones, as well as the moss, which latter doubtless was deposited with them; but the moss is not that of a long period,—not hundreds, nor fifties of years. I put the question to opponents, Why does the moss exist solely in these structures? It is never seen outside these accumulations of stones, nor does it belong to the locality,—it is marsh moss, brought from a distance. If this moss, torn up and displaced, remains thus in its new locality, why does the common saxifrage, which elsewhere abounds, cease to exist near any of these spots?

But to return to the huts. These structures,—more recent, and unlike anything noticed at Cape Riley,—indicate more purpose, more determination to reside, and are near to the very spot where walrus, seal, duck, deer, etc., are to be met with, and the profusion of such bones indicates this most completely. Deer we know to be in this region; they were fired at by some of our later party, and their recent tracks on the snow were evident.

The "teeming of animal life," described by our predecessors at Cape Becher, we have not witnessed, nor have we seen anything to warrant, beyond the chances of walrus, anything worthy of being calculated on to support a party, by the chase, on shore or afloat. Hunger, it is true, reduces the appetite to strange food; but at present no attempt to substitute walrus or bear, for other food, would be relished by the majority.

At this point coal was found, both at the huts and at

the water-line; it had been evidently washed up by the sea; also some few bits of very much decayed wood and a small flaying knife, made of wood, closely resembling,



in every particular, those of ivory found amongst the Western Esquimaux.... It was carefully preserved, with other fragments of wood found on this coast-line.*

Our operations here being complete, and no signs of the party yet advancing, launching the 'Hamilton,' we moved forward, leaving behind the necessary instructions for their guidance. This journey, being our first sea expedition, and testing the capabilities of our boat, laden with all the sledge and tent equipage, in roûgh water, was a most critical as well as interesting experiment. She answered well; was light, and easily handled. Another of the visions dependent on the state of the atmosphere, and so perplexing to Arctic travellers, bewildered us today. This was the impression of a block-house, or square building, on the slope of the north point of Pioneer Island. The nearer we approached the spot, the more we felt convinced that this time there was no illusion. We landed and pushed up the hill, with more anxiety than usual; and scarcely could I credit my senses, when I approached within a few yards of the object, to find it merely a square rock, not exceed-

* Nothing at this point could be traced of any coal-bearing associations, nor were any traces observable on the adjacent land. Bituminous shale was found on a low spit, seven miles to the south-west.

ing four feet on its sides, and not more than one foot above the surface of the ground. This was our house! I recollect something, in former voyages, of ptarmigan being mistaken for musk-oxen, but they were more distant and on the snow.

We now pushed forward for a long, low island, about five miles to the northward, appearing in the distance as a mere gravel bank; but this proved to be a deception, of an opposite character. Fortunately, we were favoured by a narrow lane of water, of which, having launched our boat, and stowed our sledge and cargo therein, we made good use, although at any moment the slightest movement of the ice might have pinched her to atoms. We reached it about four P.M., very glad to encamp for the night, and await the arrival of our party. This being a new possession, the colours were duly displayed; it was found to be at least eighty feet in height!

Our mode of encampment, etc., not having been explained in any works published, I shall here give a rough outline of the tent, equipment, etc. The tent is very similar to that of American hunters, with this exception, —instead of two forked poles, and one horizontal, resting in the forks, with the sides pegged down, the extremities of these are framed by two boarding-pikes, forming the pitch or sheers at each end, and a horsehair (clothes) line stretched over these forks, and well secured to the sledge at the back, and by a pickaxe in front, keep all steady,—so long, at least, as they hold. Instead of pegging, the sides are well banked with snow, which retains the heat, and keeps them pretty secure, if well performed; but if not, the breeze is sure to pene-

trate and create more rattling than is conducive to comfort or pleasant dreams. Each person is furnished with a blanket-bag, formed of thick drugget or felt, having an outside shell of prepared brown holland, supposed to be impervious to the air. The officer, who should always occupy the post of honour, is located at the extreme end, and that end is always placed towards the wind, in order to prevent its blowing into the mouth of the tent; he is able, therefore, to feel exactly for himself, as well as those around them. Into this chrysalis bag, by dint of a kind of caterpillar wriggle, each individual contracts himself, endeavouring, by every reasonable mode, to produce a suffocating heat, and using his knapsack, boots, sextant-case, or any other convenient object, for a pillow. Indeed, it is absolutely necessary to place any article, to be worn on getting up, sufficiently in contact with the body to preserve its flexibility, or to prevent it becoming frozen. Over the snow is spread an oilskin canvas and buffalo-robe carpet; and when all are laid out, or have supped, a general coverlet of felt is superadded, which is supposed to confine the accumulation of animal warmth. Cold, it is imagined, does not ascend, nor heat descend; yet it is very distinctly felt in both ways, especially when the warmth produces something very similar to a thaw beneath. But the enemy,—not "the sweet little cherub," etc., but the barber,—is ever aloft, condensing the breath, and dropping down refreshing snow-showers, which makes one very dubious about exposing his head outside his shell, the lap of which he manages to turn down, and complete the envelope. The cookery and other proceedings are mere

commonplace. In these tents you sleep as soundly as you can fancy, under the temperature, unless the whispers of "bear," or the ominous snuffling of that animal, should induce you to ask, "Who is cook?" As this personage, although permitted to sleep at his post, is the sentinel *par excellence*, he of course has the place next the door, and, if not very sound asleep, is aroused, and betakes himself to reconnoitre; the result may appear in another act.

In the morning we ascended our hill, eighty feet above the sea, to look for our party, and to construct one of those cairns so emphatically recommended in my instructions. These structures are supposed to be of stone; but as the ground here was fine gravel, and frozen hard, enough could not be amassed to support our flagstaff. Necessity, however, effects wonders—at least for temporary purposes; failing in stones and gravel, we had recourse to a peaty moss, found in a kind of morass at the back of the summit. The foundation having commenced with this, the men soon found that the peat mud was warmer than the air, and froze as they used it. Sailors have their ideas of enjoyment; and as this proved a novelty, a new mode of building was immediately adopted, and between peat, with black mud for cement, aided by a sharp frost, a very fine black pyramid arose, quite as solid, so long as frost continued, as any constructed of stone. It was strange, however, that the pond of black mud did not freeze nor lose its temperature during the period we remained at work; our men seemed to enjoy the warm mud, washing their hands in it before retiring, and I have little doubt that, with the

second application of water at the sea-beach, it removed much grease.

At this island we had a very fair opportunity of witnessing the effect of "piling ice," particularly as noticed on all western projections in the Queen's Channel, or beyond, where they are apparently exposed to the whole impetus of the *tides* of the Arctic Ocean. In this instance the ice had been raised, slab over slab, on the north-west point, above the summit level of the island; and at first I was so impressed that it was one solid mass, or that it could not be an accumulation of floe-pieces, that I sent the master to determine the fact, as I suspected it to be part of a berg. But it was simply piled ice, frozen into a mass, and nearly a hundred feet in height. No bergs are supposed to be seen in these seas (?). This island had been the resort of geese and eider-duck in the spring, many of their nests remaining quite distinct, and partially clothed with down. Shortly after our arrival, we were joined by Commander Richards, who had brought the whale-boat; but as I wished the fact determined, as to our depôt ordered to be placed at a point on the coast, I sent his division in-shore with instructions to rejoin me at the Great Red Island (Exmouth), then in advance about ten miles.

About eight A.M. on the 26th, we struck our tents, and moved forward, aided by a short lane of water. The day was beautiful, and, with a temperature of 29°, proved too warm for travelling on the floe, which we experienced when we commenced with the 'Hamilton' made fast behind our sledge, Mr. Loney and myself aiding, by helping the boat by the stern over the inequalities.

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Method is my invariable rule, even for the most trivial duty. So far I am an advocate for the soldiers' system, or rather what I always look forward to in our profession —the establishment of a distinct corps of Royal Naval Engineers in essence, although that term would now entail confusion, such being applied to the steam department.

"Knowledge is power," and such power enables every one conducting service of a laborious character to accomplish it with the means at command with less difficulty. The exertion of undue labour at one period of the day, and relaxation at another, when difference of temperature causes very important changes of capability, is to be regulated, and strength husbanded. In order, therefore, to determine our actual rate of travelling, I determined to pace our "spells," or time employed between breathing or resting places. I had noticed that the duration of a "spell" was subject to the will or caprice of the men, or any one indolent man, if such should be present; and I found it to be an evil requiring remedy.

Having determined, during our times of rest, that my step was equal to 2·33, or 4·66 feet for double paces, I soon arrived, after three hours and forty-six minutes' actual travelling, and pacing 43,620 feet, at the result, that our legitimate scale did not, including the boat in tow, more than average 1·9 miles per hour, exclusive of stoppages; and these I found took the range of spells or time travelling, commencing in the morning at thirty-three to twenty-three minutes before noon, and twenty-eight to thirteen minutes after noon; their strength, to my most perfect conviction, diminishing between four

and six P.M., or immediately after the afternoon's grog, which was consequently discontinued until the proper time, of supper.

About 5.45 we pitched our tent for the night upon the smooth part of the floe; but just as our pemmican was properly seasoned and ready for distribution, a visitor, not victualled, made his appearance, attracted doubtless by the savoury perfume; this was a polar bear. Our party withdrew into the tent, and the gentleman very deliberately walked up within short pistol-shot, snuffing the air with the peculiar habit of these animals, and contemplating, no doubt, a comfortable meal. A ball through his fore-arm caused him to stagger and attempt escape; but the next, through the heart, from the other barrel, laid him low. Pemmican was entirely forgotten until his skin was deposited beside the tent, our heroes declaring "that they never could get his jacket off, if he once got cold." Poor fellow! his confidence deserved a better return; but his jacket, as well as his fat (for fuel), were now important considerations. Our supper finished, and gun reloaded and placed ready for further service, we withdrew into our shells, and were soon enjoying comfortable dreams, far, very far, from polar bears; but about midnight, his anxious lady seeking him, in all probability, tracked him up to the tent, and there found his head, outer garment, and his slippers, the latter intended for a carriage comfo t for a fair friend. Her hard breathing awakened the cook, who, as I before stated, is, in addition to "the little cherub," etc., our only guardian angel, and who whispered along the bag-mouths, "Another bear, Sir."

The heavy blanket overlying me, and the difficulty resulting from the general move of my bedfellows to extricate themselves, prevented my reaching my post, perhaps, as deliberately as etiquette might demand; but I found my gun in hand, and the enemy in front, quite in time for action. The clear light which prevailed enabled me to see the eyes and black-tipped nose within about three yards of the muzzle of the piece, and one ball in the mouth and through the head was, I thought, quite enough to expend; and believing it impossible for the victim to escape, I did not fire the second. She moved away, spouting blood, and doubtless died. Some of our people tracked her for a short distance, but were soon recalled; we had already more than we could conveniently carry, although bear's-grease is with us quite as important as to our friends at home. After flinching this from the skin, the latter became a very useful pad between our ribs and the ice.

About eight we recommenced our journey, determined to use every effort to reach our red-tinted island before encamping tonight. A similar set of experiments on marching, with a little more attention to the periods of rest, afforded two miles* per hour with less fatigue. By two we arrived at the floe-edge, and found open water leading up to the island. Launching the 'Hamilton,' we effected our landing under oars alone, in less than two hours.

August 27.—This island, viewed at a distance of fifteen miles, presented, from its slopes being composed of red sandstone, a very cheering aspect, and was at first

* All distances reckoned in this narrative are geographic miles.



E.B. del.

Vincent Brooks Lith.

Exmouth Island

simply named Red Island; but this being the anniversary of Lord Exmouth's action at Algiers, I took possession, with the customary forms, under the title of Exmouth Island, which our observations place in lat. 77°·15′ N., long. 95° 50′ W.

The western peak I had before selected from Pioneer Island as my principal station, and from this commanding height I had long anticipated a magnificent view of any lands which might fringe the distant horizon. Such were my calculations when I went to rest; the morning of the 28th was bright and cheering, and, buoyed by hope, gladly did I avail myself of the sun for the requisite observations for securing my position; but in these latitudes time, in every sense, is precious. Trusting to present appearances, I did not ascend the mount until afternoon; and just as I gained the summit, and not without considerable labour, fog—the result of our fine forenoon—enveloped us, cutting off all objects beyond three miles. We constructed two cairns, and continued to wander about the summit, and watch most anxiously until eight at night, for some glimpse; but snow-drift increasing, and temperature falling to 22°, we returned to the beach disappointed.

The bay ice was forming fast, the tide of ebb running strong to the east, past this island, and towards a new channel or sea, to which, as yet, we had not traced land; it was simply a continuation of Jones' Sound, in imagination. The flood set due west; both tides had a velocity, taking the masses of ice carried to windward as a criterion, of two knots.

Recent marks of deer were noticed, both on the sum-

mit and on the slopes, particularly in the now frozen watercourses, which here form numerous radii from the mountain, and where antlers and skulls were frequently found imbedded in the loose sand. Geese, ducks, ptarmigan, and hares must have prevailed in great numbers; but we only noticed about twenty brent-geese, which alighted near us, and were too wary to afford us a meal. The formation is red sandstone, capped about twenty feet on the summit by fossiliferous limestone, in which some large bivalves (pectens, etc.) and some bones were found, unfortunately broken before they were brought to me. Beneath this limestone, the rock is swinestone to about three-quarters from the base, the entire height being 567 feet. In the sandy bed of one of the large gullies a large ball of iron pyrites was found, at first mistaken by one of my crew for a six-pound shot, and brought to me as belonging to one of the missing ships. Some very slight traces of coal were noticed at the wash of the sea, but none *in situ* on the island. No marks of natives were noticed, notwithstanding all these signs of game abounding at some seasons. Vegetation, on the great belt of this island, appeared to be more luxuriant than we have elsewhere witnessed in this region.

August 29.—This being Sunday, I had made up my mind to remain at all events for the day, and eventually even until the rejoining of the absentees. Our scouts soon reported the boats in sight, and before noon, fog still prevailing, Commander Richards and his party rejoined. They had encamped, the night previous, on a low island near us, but it was so beset with grounded and piled ice that even the island had entirely escaped our

notice! Richards had taken possession, appointing himself "Governor," and the others to various places of trust,—an act long remembered as a joke. Some tern were noticed, and a young one just born found on the nest: pretty temperature for rearing it, 22°, 10° below freezing!

The intelligence brought by Richards damped me a little, and caused me to alter my disposition of the service. 'Pioneer's' boat, detached to examine the depôt, had met with an accident, by which the men got wet and the bread damaged, besides injuring more or less all the dry provision. This compelled me to trust to my own resources, and alter the entire arrangement of the Expedition. I therefore gave Richards the direction of the particular service of exploring the next (Table Island), and of carrying up the coast-line now discovered to Village Point. To myself I allotted the examination of the *terra incognita* of which I had a glimpse from Pioneer Island, estimated in my own mind (but, I very firmly believe, *in nubibus*, amongst others) at eighteen or twenty miles beyond our present position. Fourteen days' provision for ourselves was deposited here *en cache* (with the paws of the bear), and my party were all in high spirits, with "Pet Hamilton" as our trusty friend.

Richards had already found it laborious work dragging the boat and sledge by relays, and could not therefore care much about advance, unless he replaced Mr. Loney. But Richards was the only qualified person to command, and to perform the duty required, being a surveyor. The separation was painful and inconvenient, but the separate command could only confer additional importance. Another consideration also actuated my de-

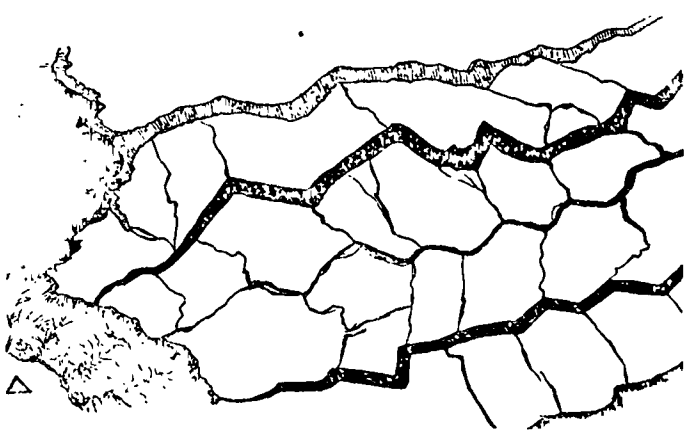
cision. I should leave behind me one of my own officers, who knew my intentions and habits thoroughly, competent to carry out the service, should accident cut me off, and who would advance, or come himself with, the necessary supplies, or aid, in the event of my absence being prolonged beyond a reasonable period.

Shortly after noon he parted for the eastward, in the full hope of achieving something new. I reascended the unfortunate mountain with the same ill-success, but before starting directed the tent to be struck, and the bivouac shifted to the opposite side of the island. My readers will, I fear, charge me with presumption, but possibly I may pay the penalty before the cruise terminates. But our business is to view all obstacles as to be overcome: "nothing risk, nothing gain."

During my detention on this southern and western point, I happened to stray with my gun to the beach, and whilst there heard the peculiar groaning of pressure, or "nip." At first I was unable to distinguish from whence the cause proceeded, but in a few minutes, after watching the dreary white sheet until vision became very imperfect, I noticed, first, an arching of the floe (prevailing here from three to four feet in thickness), then its disruption, and the flakes of ice piling one above another in slabs, until they became influenced by some greater obstruction near the land. Then a very different action ensued. Instead of the great slabs of ice, the opposing and unyielding forces, being nearly equal, caused a comminution, and the powdered substance, resembling white sugar in appearance, tumbled down most gracefully over the before-accumulated slabs, involving all in one

smooth detritus, which (eventually filled in with snow, and freezing into a mass) puzzles us so much, and induces us, without verification, to suspect the masses to be "bergs." But this is but a trivial illustration of the "ice motion" in, and to the northward of, the "Queen's Channel." It is fearful to think of the *possibility* of Franklin's ships entering this region, "to be driven by the pack;" no hope of escape could be entertained: and therefore most sincerely do I wish they cannot have passed up; for as to traces, none could exist, subject to such accumulated dangers as are hourly apparent. But this is more peculiarly forced upon my mind by the events of today. From the summit we noticed the breaking-up of a very great extent of floe, immediately in our neighbourhood: nothing but a diagram can sufficiently illustrate it.

Let the reader imagine the white sheet spread beneath him, suddenly to exhibit the deep blue sea in the cracks,



and then to notice this immense surface, some hundred acres, perhaps loosened by no apparent cause, from late-

ral pressure, fall asunder, float off, and disperse, forming in the space of an hour a dense "pack." Where, then, is the security of docking? It would prove endless labour to dock, unless our missing navigators should in the present instance happen to be to the north of this great opening, when they *might* push some twenty miles westerly,—but never again, I fear, in these high latitudes, to recover easting!

About nine P.M., having utterly failed in gaining even enough to guide me in the direction of "the wished-for haven," and having the only consolation, that as far as I could see in the direction where I knew it must be, open water prevailed to a limited distance, I quitted the mountain, perfectly confident however of success, or that we should reach it by water.

August 30.—Three days had now elapsed, and yet all in mist; the weather had slightly improved, and the sea was apparently open in our intended course: the wind also was favourable for the blindfold expedition. We packed, and started under canvas, the tent-poles serving as sheers or mast, and the tent-bottom as sail, furnishing us completely in the most approved rig of the Malay pirate *prahu*.

At a quarter past eight we left the shore, and proceeded at a very cheering rate, steering by the sun; but the breeze failing shortly after noon, we had recourse to paddles. About one, we made out *terra firma;* but as my western object was clearly defined from Pioneer Peak, and I felt great confidence in "first sight," I pushed on for it, well aware that a latitude alone, obtained there, would secure its position beyond dispute. About a

quarter past two P.M. we effected a landing within the floe-edge, and about five miles from the north-western and extreme Point of this land.

Of this new territory I now took possession for our Gracious Queen, with the customary form,—calling it, in compliment to His Royal Highness the Heir Apparent, "North Cornwall." Sir Edward Parry having adopted the western counties, Somerset, Devon, etc., the Scilly Isles, when discovered, remain for some more fortunate explorer. I know not whether "Duke of Arctic Cornwall" may be added, but we drank the health of His Royal Highness most sincerely, to that title.

Thick weather succeeded, but knowing how fickle Dame Nature is in these regions, I determined not to be caught napping. Proceeding inland, to the nearest accessible height which would command a northern as well as western range, we advanced about three miles. The view obtained was not indeed satisfactory, but we perhaps were too greedy. I saw enough to satisfy me that our present position was insular, and that no northern or western land was near. I have deemed the distance three miles, to be within bounds; but looking to the angles obtained from Pioneer Peak, I could not be less than five miles from the western point of the island, and our elevation not less than eight hundred feet. The ravines are deeply channelled out of a very friable sandstone, in the bottoms of which I noticed large masses of clay ironstone, septaria, and nodules of iron pyrites. Coal was also found, but disseminated, and impossible to trace *in situ*. Bivalves, apparently of *recent origin*, and having the cartilage hinge perfect, were abundant.

This is matter of grave consideration. When, or did the sea ever invade these heights? Yet the cartilaginous hinge was perfect, and the epidermis in many instances scarcely removed. Birds may have placed these shells; but with our knowledge of this climate, prevailing ice, and the scarcity of animal life especially, this is scarcely credible. I cannot, will not, at present say more. This friable sandstone and sand, interspersed on the surface with boulders of granite, and almost *garnet* masses, constitutes the principal features of the land on the west of North Cornwall.

CHAPTER V.

Retreat.—Land's End of North Cornwall.—Pell Point.—Table Island.—Chased by a Walrus.—Sledge breaks in.—Danger from the Ice.—Observatory erected.—Second Autumnal Expedition.—Traces of Gold.—Gale and Disruption of Ice.—Oomiak constructed.—Walrus food.—The 'Eider-duck.'—Gain the Land-ice.—Reach Point Repose.—Return to the Ship.

About eight P.M. it commenced snowing heavily, and not feeling very certain about our road back, we beat our retreat for the beach, selecting the apparently best ravine. We followed it up, and fortunately came out about five hundred yards north of the tent. On the floe edge we noticed one very large seal, and on the land a track of fox, but of no other animal, nor any traces of Esquimaux. We estimated the north-western point of the island from our elevated position to be five miles, equidistant from us and the tent.

August 31.—On the morning of this last day of August we experienced thick moist snow, temperature 30°, with the sun shining at intervals between the falls of snow and passing clouds, tantalizing us considerably, particularly near noon. Fortunately I succeeded in obtaining the latitude and true bearing of our stations on

Exmouth and Table Islands, but no objects beyond these —also secured last evening. The result places our observing position in latitude 77° 34′ N., and by the true bearing of Exmouth Island in longitude 96° 20′ W., exactly coinciding with the tangent obtained from Pioneer Peak, and infinitely preferable to any chronometer longitude. The west extreme therefore will be in latitude 77° 39′ N., and longitude 96° 15′ W., and the Land's End of North Cornwall, the north-western extreme of the island, seen from the hill, probably in 77° 45′ N., and then trending about N. 30° E.

September 1.—Our insidious enemy, the floe, had played us a trick, hemmed us in, and left no escape by water. But, supported by the picked men of the 'Assistance,' no trifling difficulties could stop us. We therefore, after a somewhat heavy tug over the land, with the boat also to transport, regained the open water, launched, and were again on our element. Jack Frost we were civil to; he was our insidious enemy, at least in the present degree. In all his vigour we laughed at him, as then we should have *solid ice*, but so long as he maintained the Christian symbol (+) he was to be dreaded.

Here we have reached the exciting 1st of September; and yet, although these regions have been portrayed as teeming with animal life, I much doubt if even the sharpest Esquimaux would find anything worthy to present to his lovely wife and daughters on this evening; even bears and foxes seem to be forgotten, or probably have not volunteered for this service. After we quitted the shore, some few timid seals put their inquisitive heads above water, as if to inquire the cause of

our visit, but were soon satisfied. Indeed the aspect of nature throughout presented that heavy gloom which should accompany this very type of barren solitude. Pulling along the coast for a period of six hours, and estimating the distance traversed to be about seventeen miles, we reached the southern angle of the island, where the first high jutting heads frown upon the coast-line, which, in the interval from our late station, presented but a succession of low spits and creeks, probably intersecting this part of the island; and at one opening, about five miles from the western station, a narrow strait appeared to divide that portion into a separate island.

Under a pair of high "double cliffs" we pitched our tent; the snow was deep for the season, and no vegetation to be traced. At sunrise on the 2nd of September, every prospect of a bright, clear day promised, and I succeeded in obtaining the sun, as well as angles to Exmouth and Table Islands, but the snow still continued to fall, baffling further exertions. I ascended the high land commanding the eastern horizon, which at that time was very clear, but no land could be traced easterly of Table Island. The eastern limit of North Cornwall I was enabled to trace about fifteen miles, where it seemed to terminate in a low spit, and then turn abruptly to the north.

I have therefore but little doubt that this great eastern space connects with Jones and Smith Sounds, or the Polar Ocean, on which the search of the next season will doubtless throw more light. Our business, it is true, does not so much concern geographical discovery, as the

most scrutinizing search, not only for vessels, but for persons or their traces; and, however confident our opinions may be that they could not exist for such a lengthened period in this vicinity, still no excuse would be satisfactory, if we failed to silence the *conjectures* of those who might even *imagine* that any reasonable spot, to which access to them would perhaps be impossible, had not been rigorously examined. That duty yet remains to be executed, God willing; and in the prosecution of that duty, it may yet be our lot to determine if Sir John left any record in the so-called "Jones Sound." It is far from impossible that his vessels may have entered this region, and have drifted even thus far. If they reached this open water by Jones or Smith Channels, my impression is that they would endeavour to gain the northern water, and may be anywhere within the parallel of 80°, but I doubt it exceedingly. The latitude of this position was determined to be in 77° 29′ N., longitude 95° W., variation 141° 18′ W. It received the name of Pell Point.

In this region, where the tides or currents are scarcely obstructed by islands, and run with some velocity, ripping up the floe like paper, much open water must of necessity prevail, and possibly still more so to the northward. This may offer the means of *drift* to and fro, but not the means of navigation; nor do these islands afford either sustenance, chance of harbour, or refuge. That they are not washed by any free currents from Asia or America, the total absence of even a particle of drift would seem to infer. The young ice threatened to annoy us; and a stretch of seventeen miles, under such

circumstances, was not certainly without risk; but who knows of any other work here—even in our brown-paper boat! Our safer course was, no doubt, by the floe; but no floe was at hand to aid us. Cutting the matter very short, we launched, toiled hard, experienced a nasty, toppling sea, but eventually got up to Table Island, fetching about ten miles to leeward of our intended port. Nevertheless we were grateful to reach the shore, and made the most of it; but heavy "pancake ice" intervened between us and our haven. I required but one glance of the eye from our ice-mate, Bond,—never behind in courage at this work: I knew that he did not object. In we went, and, by dint of labour, spooning, rolling, and eventually getting a line to the ice aground, slept on shore that night! Very much delighted indeed were all of us, and if the 'Hamilton' could blush—but she was painted yellow—she must have felt very uneasy at her praises, so very broadly expressed. One Irishman declared that he would either buy her, or have just such another built, and make his fortune on some lake in Ireland. "Well done, little Hamilton!" often burst from my lips; and many a good cruise yet do I expect her to bear me through, before she be laid up in Greenwich. Here we are then, *nolens volens*, cast ashore on Table Island. This particular spot attracted my attention from the summit of Exmouth Island, and I had instructed Commander Richards to examine it, and place marks. I fully expected to be able to haul our boat over into a magnificent harbour, formed by the low land encircling nearly the western head; but the neck, which at ten miles appeared but a thread, was now found to be

nearly a mile, and the whole interior of the harbour one sheet of ice. To this harbour I gave the name of Londesborough, and to its point Grimston.

September 3.—During the night the current had fortunately swept away the ice from our harbour, and left us free to pursue our journey. The morning was fine, beautifully clear, and the sea westerly open to Exmouth Island. Ascending one of the commanding hills, I obtained a view of the leading features of this island, as well as a station in connection with some of those erected by Captain Richards. The breeze favouring, about eight A.M. we put to sea, and succeeded in reaching Exmouth Island shortly after noon; lunched, took up our *cache* of provision, and, as the wind continued favourable, lost no further time. Winter was now approaching most unmistakably in earnest, and a few hours might render our work either very laborious or very simple. The change which a few days had made here was impressive; I could hardly recognize the features of our late encampment, and the beach was only by dint of great labour accessible. The main floe was in motion, and continued to press easterly; but the breeze increasing with heavy snow, and the tide setting strong to windward (westerly), and driving heavy pieces of ice end on to the floe, forcing the boat also so strongly on it as to damage her, rendered decision necessary. I therefore quitted the floe and made sail, but right glad were we to seek shelter for the night on "Governor Richards' Island." Chased, I believe, by the identical old walrus before alluded to at the commencement of our trip, we felt very queer, and as he muttered some unintelligible warnings, we were excessively civil.



Vincent Brooks Lith

E.B.da

The Hamilton under Canvass.

We were fortunate in reaching this island: the sea was getting troublesome, the boat refused to steer by the oar, and she was fast filling; one dash of spray, and our castles would be demolished; any impudent wave might have given us a wetting which would have rendered that night comfortless. Every such incident as that before my eyes forcibly brings to my mind the utter helplessness of any of our unfortunate missing friends. One wetting, without the means which we possessed of drying themselves, would have destroyed their energies.

On the morning of the 4th September, the wind having lulled, we launched our boat, and pushed forward to avail ourselves of the yet open water. About noon we succeeded in effecting our disembarkation on the floe, and, after luncheon, recommenced floe-travelling. Shortly after we discovered the other party in-shore of us, under the land. At one of our halting-places, Commander Richards and Dr. Lyall came up with us, and having spared them part of our provisions, we resumed our progress, fully expecting that they would overtake us at our resting-place, for which object we shortened our march. They evidently made heavier work, and pitched one mile short of us.

September 5.—Having nothing further to detain us, we made the best of our way to Village Point, expecting to reach it this night; but the half-frozen lanes, breaking repeatedly, considerably retarded us; latterly however I contrived, on some occasions where it was very narrow, to bridge the passage by floating pieces of ice cast into the gap, and by a dexterous run over our floating bridge, got safely across before it became immersed. Owing to

such delays, we were compelled to encamp at evening, still distant from Village Point.

On the 6th we experienced a fine, sunny, lovely day, and pushed forward at 8.30; but, still retarded by the difficulties before alluded to, it was not until 8.30 P.M. that our advanced party, with the boat alone, reached the point. Having pitched the tent, a party was sent back to bring up the sledge. Unfortunately they had no officer to lead them,—got on to young ice,—broke in, and very nearly lost one of the crew; providentially it did not prove fatal to all, as, from their account of the matter, they acted very injudiciously, by simultaneously rushing to the edge of the broken ice, to save their shipmate, instead of forming a connected chain to more solid ice. I almost instantly detected this misfortune, by noticing a single man on the outline of the snow, wringing his hands and throwing off his boots. Mr. Loney and others were despatched in aid, but noticing the remainder of the party showed their heads, I detained the cook, to prepare hot tea, etc., which the man who had been immersed very much needed,—reaching the tent, assisted by two others, in a very exhausted state. He was soon clad in dry clothes, a dose of hot tea and spirits administered, and packed in his bag; and by the time he got warm, a pint of hot chocolate and pemmican were ready, to complete him for his slumbers.

September 7.—The morning fine, but temperature 18·5°. Moved up to the crest of the peninsula, crossing recent tracks of bears, foxes, and deer; the latter either very numerous, or a pair had been making very extensive gambols, tearing up the grass, etc.

Commander Richards was noticed making good progress down a lane which had opened, and, by the time we were about to quit the Point, landed to receive his final orders. We then moved on to Pioneer Island, to complete our work, and thence to the ship; but experienced very difficult work in crossing the young ice, which threatened several times to press the boat by a *shear-like* movement, one sheet overlapping the other, but she escaped with one hole only in her bows, which I succeeded in stopping with my silk handkerchief. Unfortunately we did not reach the ship this night, but encamped on the floe, and fired a rocket almost over their heads, to warn them of our being near: this, however, was not seen.

In the morning we pushed forward, and soon joined, or came upon the track of, the other party, which, by not having any off-shore duty to execute, had avoided our difficulties. On opening Mount Beaufort, we noticed parties from the ship advancing to aid our men; but I believe that in the succeeding two hours, until we reached the ship, more damage and wettings were experienced than during our whole cruise. This resulted from the ice being much weaker in this direct line of greatest tidal force: it is the last portion frozen, and the earliest thawed. About 4.30 I re-entered my cabin, quite prepared to enjoy every comfort it might offer.

Winter Operations.—The winter had now been completely established, and the 'Assistance' and tender firmly frozen in. The customary preparations were made for housing in the ships; but as we considered the vessels too secure to require any extraordinary preparations, the

topgallantmasts were merely housed, and sails securely furled.

The absurd fittings of the Sylvester warming-apparatus, requiring the main hold to be nearly cleared before the fires could be lighted, compelled us to place the provisions, etc. on shore, as well as the greater part of our sails, boats, hawsers, etc. In all this I of course acquiesced, because it was the routine of my predecessors; but I must say that, for many reasons, I doubted the propriety. In the case of provision especially, I do not think that salt meat, subjected to excessively low temperature, is improved, but, on the contrary, vitiated; first, by the freezing process rupturing every vessel which before resisted the pickle; and, secondly, when thaw takes place, permitting that same pickle to take greater effect on the meat. It is very near akin to curing meat or Burnetizing timber by exhaustion.

The Magnetic Observatory, constructed from pieces of wreck saved in Melville Bay, I found well advanced, and near to it, beyond any possible influence of the iron employed, at a distance of twenty yards, one of the cutters was inverted, on supports, to afford a thermometer house. In this it was purposed to submit all the thermometers supplied, to direct exposure on 180°, or half the circle, facing the south (true). The Observatory was also fitted for two transits, which could be brought to act together, independently, or on certain stars at fixed altitudes. This was eventually given up, and the instruments removed; first, on account of the cold affecting the clamps, but principally from the breakage of two levels by meddlers, and, finally, some influence which I

fancied their steel fittings might have on the more important movements of the magnetometer.

The walrus, before mentioned at our departure on the north-east journey, floated or was driven by the pack near the ship, and its carcase secured by our sportsmen for the dogs. The body also of one of the others, shot at a later date, was rescued from a bear, who intended to devote it to his own use. Several bears had been shot during my absence, and their carcases also served to increase our supply of dogs' meat.

The winter operations being in formal progress, and not requiring the superintendence of heads of departments, my attention was directed to the conveyance across the channel, to Cape Lady Frankin and Barrow Island, of the necessary depôts for the spring travellers. This service was allotted to Commander Richards. A boat had been stripped of every useless encumbrance, and a sledge fitted to carry her. The depôt was packed in casks, reduced in the stave to the utmost lightness consistent with security, and the day appointed for this duty was the 14th September. Our hill-scouts however reported the ice to be loose, exhibiting suspicious streaks in all directions; in fact, the middle-channel ice was still in motion. I must say that I was not disappointed; there had been a manifest pressure from without that I must follow the motions of my predecessor, without adequate reason, and as he laid out his *caches* in autumn, I must, perforce, follow his example. I certainly was prepared to do so, where common sense pointed it out as practicable or urgent: neither of these were appreciable at present, and the risk to men, stores, and anxiety about

them, rendered its propriety very questionable. This fortunate consideration sealed its fate,—it was postponed. But in order to divert our minds to other more important matters, and to dispel some doubts in my own mind as to the complete search on the islands skirting the shore between this and Cape Becher, for traces of our missing ships, I determined on another small expedition, with the same force as before, intending to leave at Cape Becher a record of our late proceedings, and whereabouts, to guide Commander Pullen in his visit in May.

Having delayed until after the spring-tide of the equinox,—which period I calculated, from the record of temperatures on preceding occasions, that from 6° to 10° were the best freezing-points for the sea, when we might expect the ice would again be compact enough for travelling,—we left the ship on the morning of the 21st September, in the teeth of a southerly wind and the snow in our faces, with thermometer at 10°. I was persuaded to leave the 'Hamilton' behind, as the small pack-ice might destroy her; but I had reason to regret it.

The expedition consisted of the same sledges and crews as before, but without the surgeon and Mr. Grove, and we had only fourteen days' provision. Our journey lay for twelve miles, at least, over the smooth floes of Northumberland Sound, through its neck (or channel whenever thaws permit) into Baring Bay. But as this was also a service of survey, we had frequently to stop, ascend heights, and construct cairns: these matters will not much interest the general reader—I shall therefore skim lightly over the surface. Our first halt for the night

was under the slope of a long tongue from Mount Percy, forming the channel between that island and the main.

The next morning we moved on to Glacier Bluff, and Commander Richards ascended the mountain which caps it (named Blanche, after one of the Banner ladies), whilst we were engaged constructing a cairn beneath. One of the crew, noticing a bright streak on one of the stones struck by the pickaxe, exclaimed, "Gold, Sir!" As the rock was a heavy piece of quartz, I stooped to inspect it; but thinking it to be merely a vein of iron pyrites, ordered it to remain undisturbed, as I was then using the instrument, and ultimately a piece was broken off for future examination. The large piece was also inserted in the pile, with a case of pemmican, to await our return. There was little fear of desertion to these diggings! However, I kept the development of our riches for our return. On this expedition I also brought the dog-sledge and three of our Cape York dogs, which carried me and about forty pounds' weight of instruments very cleverly. From the summit of Mount Blanche—the highest in this region—Commander Richards had a good view, reporting "the ice close and apparently firm."

This Point received the name of Pemmican Station, and is the commanding jutting tongue of the northern narrows, or the pre-supposed neck of what we had believed to be Percy Peninsula, but now clearly defined as a very narrow boat-channel.

We pitched our tent for the night on the outer head of this entrance or bight of Baring Straits (?), giving it the name of Point Repose. The terraced nature of the land here afforded good shelter, on fine gravel, from

easterly winds; and beneath, in *warmer times*, a very snug little yacht harbour might be available within a tongue of projecting shingle. But the ice on which we were now to try our chance was most unpromising. The 'Hamilton' could only have been conveyed on her own carriage; indeed, would have been deposited here *pro tem.*

On the morning of the 23rd we advanced towards the outer island, the western extreme of which forms Point Sophia of the old chart. The travelling was difficult, by reason principally of newly broken young ice, of every imaginable angle, cemented together by the late frosts. Over this, as it jarred my limbs walking, I tried the dog-sledge, which answered admirably on the smooth ice; but meeting with an awkward lump, I experienced a most unpleasant summerset, inflicting rather a severe concussion to my head and neck, which had been injured on the 1st of October, 1850, by a fall. As this accident occurred to the opposite side, it tended to cure it; but the remedy would not, I suspect, be prescribed, even in these days of innovation. (I have since perfectly recovered.)

We reached the island in safety, landed, and erected our cairn. I found the rock to be composed of a dullish dirty brown, sometimes variegated, swinestone, probably susceptible of polish; it frequently exhibited veins or layers of chert, the sharp fragments of which rendered it very unpleasant to travel over. As this island was one of the dreams of Penny, I retained Point Sophia, and added Cracroft Island, in compliment to his enterprising spirit. On my descent, I found some of the party annoying a few ducks in a pool of water; but as they could

neither kill, nor get them if killed, I thought we might stand a better chance hereafter by not now coming to hostilities.

Our party was now divided, Commander Richards being directed to seek the outer point of the next large island, and shaping my own course to its inner point, hoping thereby to save time and labour. Our sledge broke in and wetted some articles, but we reached our destination without further accident. The latter part of the journey was attended with considerable anxiety, owing to the rotten state of the ice. Commander Richards had a cold bath; and even when we had reached within a few yards of our destination, landing was doubtful, and only effected under great caution, taking some of the light weights first, over the new bay ice, by the dog-sledge. Having encamped, I ascended the highest hill, which commanded a great range, and obtained my observations. The temperature fell to 8°, and our prospects were at present propitious, with every probability of the ice strengthening. It is, perhaps, venturing almost too much upon English ideas of temperature, but it is no more strange than true, that, with this temperature, 24° below the freezing-point, some of us were wishing it, at least for a period, lower! Our presumption, possibly, was to be punished.

Before morning on the 24th September we had it at 20°, with a strong breeze from east, and much snow-drift. I began to feel great anxiety about Commander Richards and his party, having given him instructions to proceed on to the projecting point of the next island, if his work was executed in time. Mr. Loney was de-

spatched to seek him, and luckily finding him at our opposite point, delivered my instructions to rejoin me with all despatch. This indeed was imperative, as he was on the most exposed part of the island, and was but too glad to reach our more sheltered position. They encamped beside us near noon.

The result of this gale, with temperature increasing, was obvious. The ice gradually broke up, and drifted away piece by piece; and "short commons," if not worse, was to me apparent. I did not hesitate on petty measures, but instantly ordered the reduction to half allowance, and our attention was further directed to the best mode of relief. My own plans had been already formed; I therefore merely dropped the hint that I intended to build a boat,—leaving any brighter intellect to "furnish plans and estimates."

Unless calm prevailed at least for three days, aided by low temperatures, we had no hope of escape, even to the mainland! It is true that the entire ice had not yet broken up, but it would not bear our weight, even across to the southern island.

September 25, *Saturday.*—The wind abated; temperature 11° at noon. The sergeant wounded a walrus, but it was beyond our reach; and several eider-ducks were swimming in the pools, but as they could not be obtained, even if killed, orders were issued to reserve the ammunition. In the evening the wind shifted to the northward, and the temperature fell to 8°. The slumbers of those who slept were probably pleasanter, but prayers for *lower* temperature, or *intense cold*, possibly had not before been so devoutly offered (?).

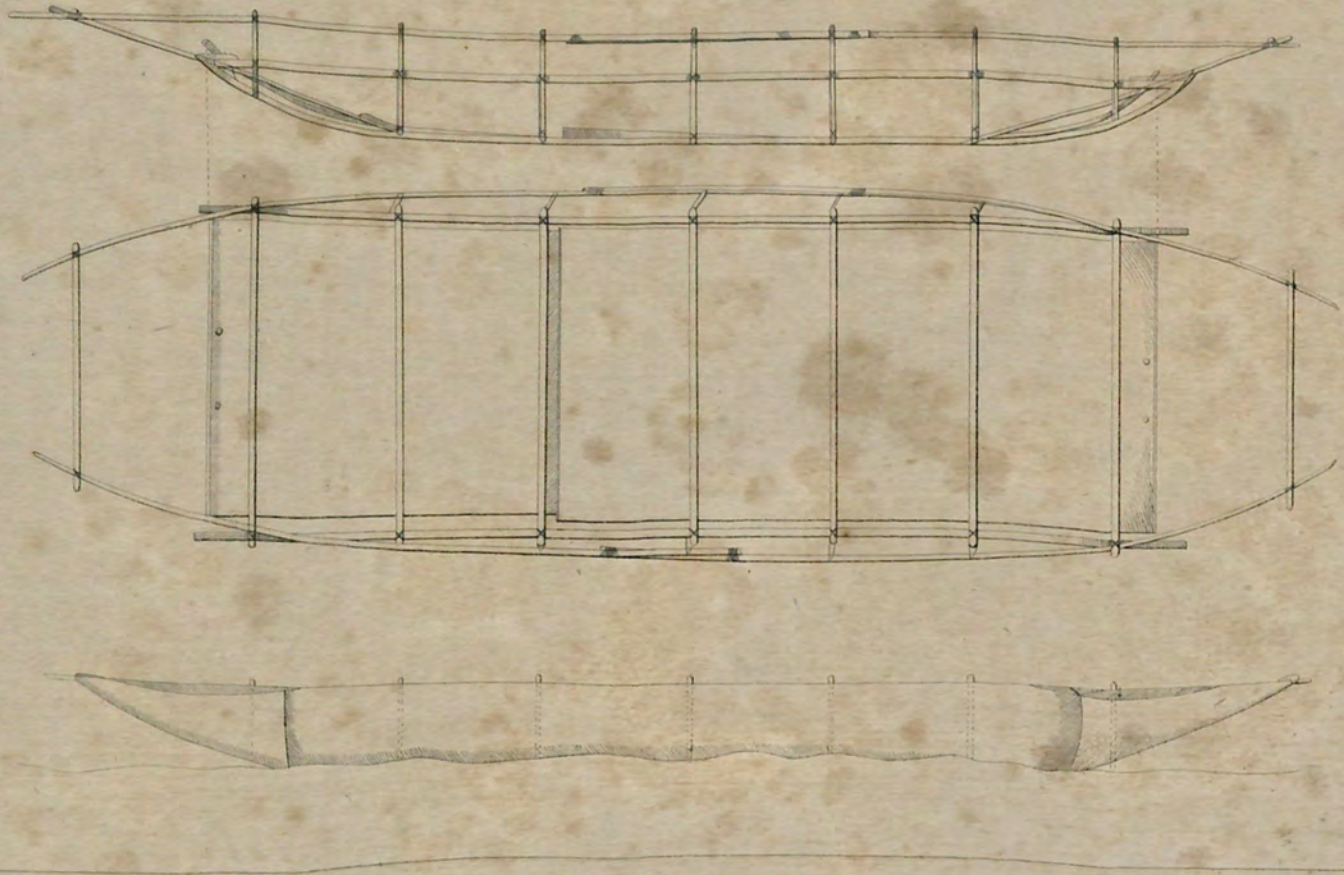
September 26.—This day was calm and serene, but the sun's bright rays had little charm for us. I strolled to the eastern point, and found the ice strong enough to bear three men, who walked across to the southern island. But on their return, their report proved but a damper to our hopes: the channel between it and the main was "open water." The evening was beautifully clear and serene, but the wind again drew round to east, and the temperature rose to 13°,—sure indication of further bad weather. About sunset I shot a walrus, which remained on the floe-piece probably mortally wounded, but we were unable to reach it. At dark, about eight, and again at nine, rockets were sent up, to indicate to the ship our position and want of assistance. From the hill-summit I thought I could see Mount Beaufort, or the land immediately behind her; but our hopes were vain—our eyes were strained to no purpose—no reply! Once I was mistaken by the sudden unveiling of Venus, just at the spot where I expected to discover the signal or burst of the rocket.

Early on Monday, the 27th, the wind increased, with snow, sleet, etc.; ice breaking up, and sweeping past us. The shout of "A walrus close to, and drifting in-shore," caused no little excitement, particularly amongst my own energetic men. Bond, the ice-quartermaster, aided by another, put off on a piece of *loose ice*, with a line fast to the shore, and succeeded in hooking it with a boat-hook, by which means he drew it to the shore, where it was soon secured. No sooner was this done than some few more oozed out of their bags. But this did not suit. "All hands secure walrus!" brought each

man to his duty, and the agreeable monster was secured, cut up, and deposited at the tents—a most acceptable boon in every way. It not only secured our *existence* until the ice re-formed, but afforded plenty of that next blessing to food, the means of cooking and obtaining water—*fuel*. Now might be heard the discussion of who killed it: of this I cared not,—we caught it, and it was yet warm, and good food. It had been shot in the throat, a wound generally fatal, and causing them to seek the floe to die. Another gratifying feeling was also afforded me—that our dogs would find sustenance; for the loss of them, by starvation or compulsion to kill, would have distressed me considerably, next indeed to personal misfortune.

It continued to blow hard, with sleet, rendering our labours very harassing; but activity and employment for mind as well as body must be found. I had great difficulty to contend with. Snow-walls were ordered to be built round our encampment; and, as it occurred to me that this would prove a convenient moment for practising our men in house-building, I superintended personally, as chief mason, in this practice.

On Tuesday, the 28th, the wind shifting more southerly, and no "plans or estimates" for the boat having been sent in, I proceeded to work in my own way; and I must say, although the others volunteered, when she was constructed, to command her, that Mr. Loney did so before I commenced, in the full confidence of success attending. However, volunteers do not guide me; I select those to whom I intend to entrust the duty, and Commander Richards would have been selected.



B. del.

Vincent Brooks Lith.

Oomiak formed by Sledges.

Taking one runner-sledge as my framework for an *oomiak*, and two flat sledges for the ends, it will clearly be seen that the rudiments were in a state for completion; ribs were then brought up at each runner-bearer, rising about one foot above the sledge; and to this, oomiak-fashion, I formed my gunwale by four light spars, two of tough China mahogany, and two bamboos used for yards, for sledge sails: by a little straining these were brought nearly together at each end, and cross-pieces lashed. It was, indeed, to those versed in Esquimaux boat-building, the *oomiak*, or woman's boat. It only remained to cover this properly; this was effected by the canvas-bottom cloths and Mackintoshes of the tents, so as to form two layers.

The object was, to convey to the main a party with one day's provision and their sleeping-bags, who would walk on to the ship and forward to us in due time the necessary relief. As the three leading officers of the vessels and twenty-seven persons were thus cut off, I determined to remain alone with my own men and Mr. Loney, sending Commander Richards, Lieutenant Osborn, and any others who could not eat walrus, by the boat.

He was to have started early the next morning, and his orders were already written; but as the equinoctial spring-tide here would not occur before 2.30 on Thursday, I determined to defer it until that event had passed. To oppose the antipathies of any set of men, is absurd, —is making them of too much importance. I dislike pemmican,—never would touch it if I could avoid it, because I consider that it is, to me, unwholesome food; many of my crew also refused it for some time: I con-

tinued to eat it for example sake. Others also dislike particular birds. But my principle invariably is, to endeavour to make anything fit for food palatable, and, setting aside my inclinations, to make it suit my purpose. I would not prefer whale or walrus flesh to the *best beefsteak*, but I would most assuredly prefer the best whale or walrus to many meats *termed beef*. Of this walrus I not only partook heartily, but I think that I overcame the objection of many, and that thereby they gained a wholesome and nourishing food, instead of semi-starvation. I had almost forgotten to mention that, in order to prove our boat, I started with four hands in chase of some ducks in the open water, killed four, and a grey dovcky, which were divided as four would be by three, the lawyer taking the remainder for his pains; they afforded, with walrus and bacon, a very acceptable meal.

On the 29th we experienced strong gales from east-south-east, which caused the ice to break up rapidly and drift off. The tide at noon today rose beyond its ordinary level, carrying off all the heavy grounded masses of ice, and denuding the shores of the island to the gravel; an occurrence of sea-washed beach not witnessed by us since the 28th of August.

On the 30th, the wind having changed to the south-west during the night, the loose ice packed in upon us, and toward the evening it moderated greatly, leaving a fine, clear night, with a temperature of 22°, but much too warm for our excited feelings. At nine I made the preconcerted signal to the ship for assistance, viz. two rockets. Venus showing between the passing clouds at



T. M. Dougal del.

Vincent Brooks Lith.

Duck Shooting in Oomiak.

the very spot where our attention was directed, afforded the suggestion that she accepted the compliment. But nothing of this nature from the ship was noticed,—a matter becoming about this moment painfully exciting.

I had omitted, amongst such serious considerations, to notice the launch of our new vessel. It is usual in lower latitudes, or in the regions of the grape (or even of malt), to christen such bantlings with the customary honours; but on the occasion of our launch there was nothing at hand but snowballs, and in sober sulkiness she took the water under the appellation of 'The Eider Duck.'

Commander Richards became very anxious to make the attempt to cross; but with the rough packed ice this was not safe. Indeed I had determined not to risk our all on any ill-considered experiments.

On Sunday, the 3rd of October, was our day of rest. Many solicitations to cross were repeated; but I had no confidence in anything around me, and I felt that when I ceased to command, then the spirits of my best men would flag, and that where difficulty and danger was to be braved it was my duty to lead. Besides, some undefinable feeling prompted me to delay: who shall attempt to unravel this curious or rather mysterious habit which has followed my fortunes? I was firm; providentially, I must add, I deferred until the morrow.

On the 4th the temperatures fell successively from 16° to 4°; but the ice, although frozen in many parts, still exhibited very suspicious cracks. Unaccountably I had now arrived at my determination,—why or wherefore, to myself is inexplicable; moreover, it was still more

incomprehensible that the advocates for crossing yesterday were now *adverse!* But that mattered not; I felt quite assured of the practicability, if I could cross the band of smooth ice intervening between us and the pack, but that would not bear the weight even of one man!

The order "Down tents!" was the first indication of my resolve. The ice was broken, and a channel for the 'Eider Duck' cut by spades; it closed, was cut again, and eventually, not without much trouble, all our effects were ferried by our valuable oomiak to the solid ice. The 'Eider Duck' underwent immediate transformation, worthy of any pantomime, her various parts resuming their duties in the sledge equipment. Moving forward in right earnest towards the main, we reached it, and lunched on the "land-floe" at noon. Every one has his peculiar feelings: we had crossed many cracks, escaped many serious difficulties, solely by dint of that activity which results from the innate fear of losing all. We thus quitted "Hungry Island,"—a name which I do not think even Penny will dispute.

I must believe that every individual had his own earnest feelings as each touched the safe shore, or land-ice. For myself, I felt that the meal was more solemn than usual. Such sensations are better left undescribed, for neither the feelings nor the pen can execute their duty.

Our actual difficulties were yet to be encountered, but we knew them not. Several wettings were experienced, and at nightfall, on reaching our most critical position, we had not found safe landing for the sledges, which still lagged behind. Fortunately I was in advance with my dog-sledge, and, trusting to the instinct of the ani-

mals, which refuse unsafe ice, they selected a safe passage; I landed, and, establishing the ferry, sent the dogs back with the driver to convey our equipment by light loads on this sledge. Frequent trips increased confidence; for several had fallen in and got wet, and our sleeping-bags unfortunately shared the same fate, my own, I believe, amongst the number. Eventually all were safely landed, and our tents pitched at *Cape Repose*. Before ten, I think, thanks to an overruling Providence, all were safely landed; for I am convinced that no security could have been found that night on the ice, the temperature having again risen to 23°. Many indeed had wet beds, but with our warm suppers this was now but a trifle.

On the morning of the 5th I despatched Commander Richards with the other sledges to the ship, with two days' provision, reserving the remainder to complete our survey. On examining our old quarters, where we had deposited the dogs' food, we found that it had been robbed by bears; but the dogs having devoured their full travelling allowance of walrus at Hungry Island, this was less important. Our subsequent motions being but matters of survey, I shall pass them rapidly. In our advance to the ship, we called at our North California for our pemmican, and to seek any further specimens of the precious metals which might turn up. In the latter search I was unsuccessful. The temperature, having fallen to 4°, was in itself sufficient to check any ardent pursuit after metals; they bite as severely in cold weather as gold does in California or Australia. About noon we met a relief party from the ship, under

Mr. Herbert, mate, and Mr. Ricards, assistant-surgeon. Moving along the coast, we slept in the Sound; and at eight the following morning, starting for the ship with the dog-sledge, were again met by Messrs. Groves and Pym, who most kindly and charitably shared with us a very acceptable luncheon of sandwiches and sherry. About eleven we reached the ship. Never did I enter my cabin with more unfeigned thankfulness; not for myself alone, but for the safety of the fine set of men who had shared our misfortune, and whom this particular branch of the Expedition could so ill afford to lose.

CHAPTER VI.

The 'Assistance.'—Winter Fittings.—Moisture between Decks.—Meteorological Investigations.—Tide Gauge.—Anatomical Shrimps.—Washhouse.—Thoughts on Arctic Fittings.—Terraced Levels.—Effects of Tidal Action.—Tidal Fissures.—Experiments on Ice.—Last View of the Sun.—Her Majesty's Arctic Theatre.—A Gale.—The Observatory.—A Snow-storm.

Our own miseries terminated, turn we now to the good ship 'Assistance.' As I had anticipated, the ship had not been a whit too secure, and the absence of our party might have entailed censure on me, had any serious mischief occurred. I was informed that the ice had broken up to within a hundred yards of her bow; and that, in the expectation of its proceeding further, warps had been carried to the main floe to secure her. Had the ice broken up here, as it did at Hungry Island, there can be no doubt that she would have been driven on shore; but the want of tide prevented this. As it was, the ice had cleared out up to the southern point of the Sound, and a sporting party had visited it in one of the boats, but without any view of relieving our necessities.

Any of the above misfortunes, viewed singly, might be deemed trivial; but the loss of the principal petty

officers and myself might have very much changed the results of this Expedition.

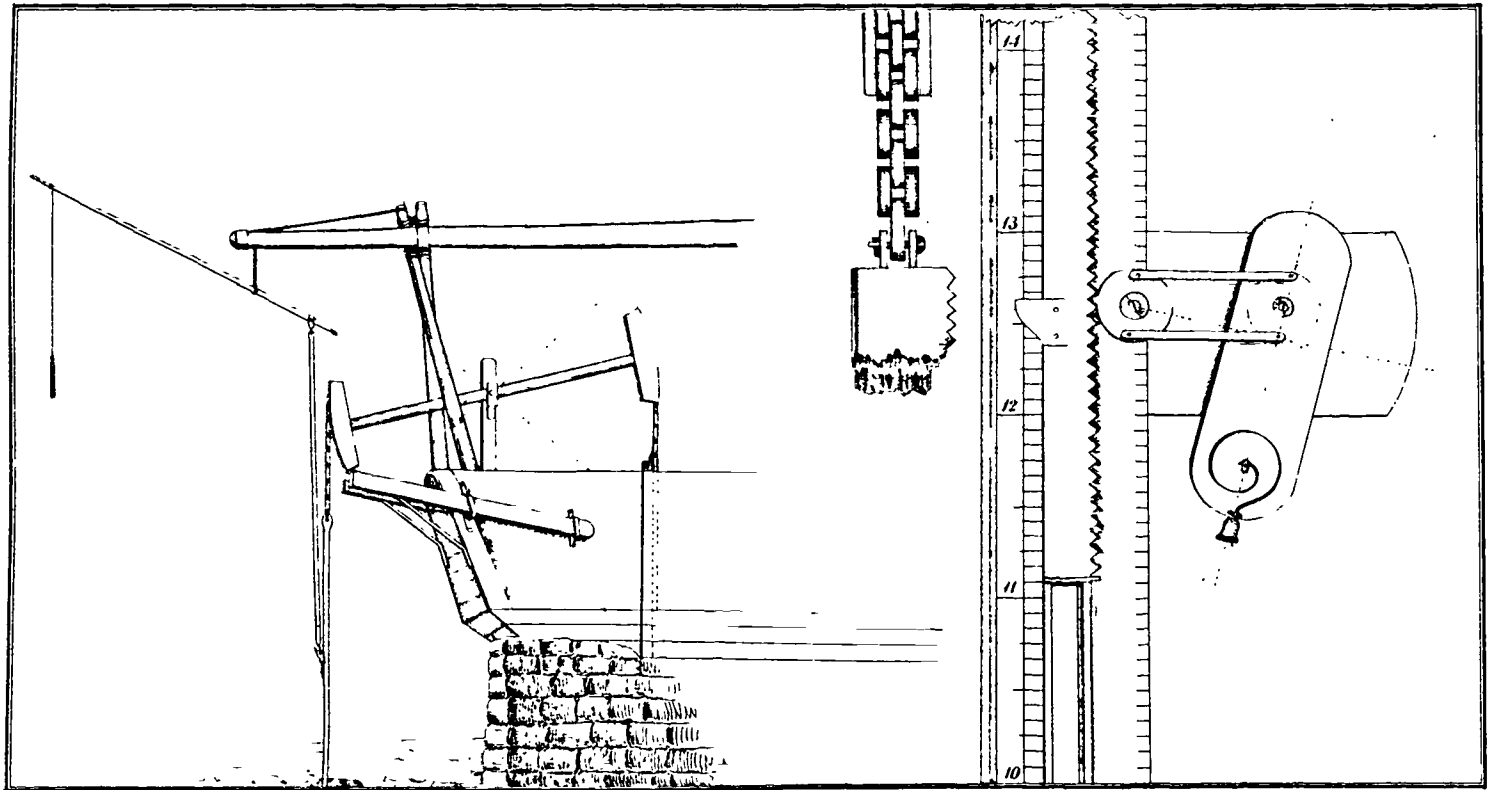
Our attention must now naturally revert to the completion of our winter arrangements. The temperature had not yet afforded sufficient proof of the necessity of covering our decks with snow, or building walls round the ship: of the propriety of both these matters I entertained my doubts, and wished further experience before I committed myself. Of the advantage to be derived from a good snow-wall, distant about a foot from the sides, and suffered to fill in with light snow, I had little doubt; but the plastering on a non-conductor a solid body of fine ice, such as the snow-embankment arrives at eventually, could not prove of much importance. The matters connected with winter fitting have never met with a due amount of deliberation in England, or I feel well satisfied that much better arrangements for securing the health, as well as comfort of the crew, could be attained by more simple as well as efficacious means than those generally adopted. But these matters should have had full consideration in England, and the means for carrying them out provided. Beside this, there is a kind of awkward responsibility attending innovations of this nature, which, unless founded on something stronger than mere authority, would induce restless writers to attribute every mischief and misery, however remote from common sense, to the innovator. Under such reasoning, the only alternative is—"If they were miserable and sickly before, Captain —— found he could not remedy it; and therefore, however comfortable the cabins of the captain and officers may be, matters must be conducted

as they were by their predecessors." Now, I am firmly of opinion that Sir John Ross was right as to his system of ventilation, but carried it on upon such a reduced scale that it could not act sufficiently. And I feel fully satisfied that the evil in these vessels might be remedied by hatching the present decks, and in winter removing the crews six feet lower. Such a disposition would avoid the immediate condensation of breath on the lower deck beams, resulting in a constant dripping on the lower deck, and, at night, soaking the bed of every man sleeping there! Undue wet and pervading moisture, and that too charged with the customary constituents of the breath of men, is but too well known to be the predisposing cause of scurvy; and yet, knowing all this, will it be credited, in the last portion of the nineteenth century, that horse-sponges are supplied to wipe off this moisture?—a thing only to be discovered in October, when these drippings commence, and when the daily doleful report of the surgeon is, "She is so very wet between decks, Sir." And, as if this should not be a sufficient warning, I find that vent-holes, to let down cold air, to increase and keep up this condensation, are actually opened, when the heat below cannot be maintained at 40°, and was frequently, even in my cabin with a stove, below 20°.

This season may pass, and, I sincerely trust, without any material mischief; but should it be our lot to pass another here, I have fully made up my mind that, having given the plans of my predecessors a fair trial, a very different system will be enforced, for the future comfort of all.

As Lieutenant Cheyne had brought with him—supplied, I understood, chiefly from Kew—some very delicate electrometers, I determined that he should have every assistance the service admitted for attending to the influence which the aurora might exercise. To ensure this, he was excused from other duties, and directed to attend to the registry of thermometers; and as it would be inconvenient to send officers aloft to register thermometers, I adapted a balance-pole of twenty-eight feet in length, so that it could be easily pulled down; to this a minimum thermometer was attached, to be read at eight A.M., at noon, and at four P.M. Another plain thermometer was also fixed at twenty feet, and one of the standards was placed on pikes at four feet above the earth, near the Observatory, independent of the general board, containing fifteen standard thermometers from Kew and Greenwich, under the boat. The pike-thermometer was registered hourly with the magnetometer. A very delicate electrometer was also placed in the Observatory, but was broken not many hours after by the prying curiosity of some meddler.

Before the 8th of October the general observations on the magnetometer were supposed to commence; at all events, the registry dates from noon of that day. The officers who volunteered for that duty were Lieutenant May, Mr. Herbert, Mr. Grove, Mr. Pym, mates, and Messrs. Harwood and Webb, engineers, of the 'Pioneer.' The observations were continued hourly, both night and day, throughout the winter, up to July. Various other observations were carried on by myself, at the instance of Mr. Glaisher, of the Royal Observatory, Greenwich,



Printed by Vincent Brooks

Alarum Tide Guage

who supplied, by authority of the Admiralty, a most valuable suite of thermometers and other instruments, and spared no exertion to afford valuable information and suggestions for their management.

As the decrease of temperature would soon prevent the accurate registry of the tides by our tide-pole on shore, I made some experiments on the true rise and fall of the ship, now firmly frozen into the floe, so as to guide me in selecting her as the index of floatation, or tidal level. To determine this truly, I placed the theodolite so that the level wire should coincide with a zero mark on a batten nailed on the ship's side. This instrument being fixed, the readings at each inch, above or below, being compared with the tide-pole already established near the shore, and found to be nearly identical—in fact, those indicated by the ship being more decidedly even—I had no further hesitation in adopting her as my intended gauge. The *modus operandi* instantly occurred to me, and I at once determined to make it a plaything or complete piece of machinery. This required a little labour in my cabin, but it was soon constructed, and told its own tale, marking the *inches* of rise or fall by agitating a bell. As it will be better understood by a diagram, I must refer my readers to it for explanation.

All seamen will understand the matter without difficulty, but I fear that I may not be so fortunate with civilians. It must however be apparent to all, that by affixing a large as well as heavy weight to a rope, and sinking it to the bottom, the weight, provided the bottom be firm or gravelly, would gradually acquire a steady position by agitation. This done (at *a*) below water, and

previously well secured, a good spar was lashed to this rope, and a fair strain kept on it for some days. The rope thus became frozen like a solid wire; the upper end of this pole was connected by an iron clasp, with a flat moulding or clock-chain formed of oak and copper. To ensure its being at all times perpendicular, as in pump-work in mines, etc., the radius pieces *b b* were attached with channels for the chain to work in. This balance-beam acted in a metal-formed crutch, with pin, and was attached at the inner end by a similar chain to the gauge-rod, which alone was sufficiently ballasted to preserve a steady and even strain for the descent of the gauge. Externally, to keep the pole steady to its work and at a constant tension, an additional lever-balance was employed, with a strain equal to 56 lbs. It is clear, then, that the bottom weight being too heavy to be moved by any ordinary force, that the rise of the ice, or ship, must draw up the index-bar; and, being of itself considerably heavier than the outer pole, etc., the descent of the ship must cause it to fall. All this being covered by the housing in-board, was protected from snow or any other inconvenience, and the gauge occupied on the quarter-deck the position of the wheel—unshipped for the winter. Beside it, was a temporary table and a lantern, illuminating the graduation, and enabling the person watching to register it. But our mode of registry, by equal altitudes, requiring the time at each inch of rise or fall, a ratchet, or notched edge, was cut on one side of the movable slide, which acting on a one-toothed wheel, caused it to draw from its perpendicular a plane board, at the lower end of which a

spring-bell was attached. At the instant this tooth became released, at the passage of the inch division, the board, ballasted with the bell, in its attempt to recover a vertical position, vibrated over the described arc, and caused the alarum to warn the observer to note time. At one period I contemplated leading it by a fine brass rod into my cabin, but I soon found I had quite enough of other matter to occupy my attention. After this had acted satisfactorily for some days, in comparison with the gauge on shore, the latter was removed, the ice forming too fast about it to be of further use.

The gauge in the diagram is ascending past twelve feet seven inches; at twelve feet eight inches the bell, being drawn up to the side of the gauge-frame, will vibrate, on its release, nearly to the same distance that it was drawn out of the perpendicular, the tooth of the wheel being so calculated as to pass freely at the instant of release at each inch, and is not taken up again until it has moved over a quarter of an inch. This alarum eventually became troublesome, and, finding the attention of the observer could be ensured, it was latterly muffled.

Our specimen-net was sent down, charged with the heads of bears and other animals, to be cleaned by the shrimps, as they are termed, but a species of *Oniscus* or sea-louse. Two eels* were taken, which rather discountenances the idea of their not bearing cold; I am not quite sure, however, that they were truly eels. The take of these crustacea was so plentiful, and they were so large, that some of our gourmands attempted to substitute

* This question not decided.

them for shrimps; and they possibly answered quite as well, if the shells at least are eaten in both cases: *De gustibus*, etc.

The washhouse for the crew was constructed on shore, composed of blocks of snow, now sufficiently frozen to be easily handled, and cut by snow-knives into any required forms, much resembling the working of very soft Gloucestershire oolite. Unfortunately our Surveyor-General of Works had miscalculated his ground; and after the walls were up, the rise and fall of tide caused certain ominous gapings in the gables, which was but partially remedied by disconnecting the land-floe by a ditch. However, this not being deemed satisfactory, a new inner wall was constructed, making another parallel room or double house. This is another feature of Arctic arrangement which does not suit my views of economy of fuel, of comfort, or sound judgment. First, the expenditure of coal is wasted *out of* the ship; next, the men are sent to light a fire with wood, etc., in a cold house, and expend half the fuel before the copper is warmed. The temperature there is too cold, especially when the thermometer falls to 62°, for such operations as washing; and before the clothes can be wrung properly, they are a mass of ice, and the shivering unfortunates are seen, with their clothes half washed and ice-bound, wending their way across the floe to the ship—for what?—to carry *below into the main hold*, beside the Sylvester apparatus, these masses of ice, to be converted into vapour, and diffused between decks. Verily, there are too many ways of inviting sickness without this!—but "it was done before," is the reply.

I purposely introduce these remarks, not in any manner as a reflection on my predecessors, who, I am convinced, were quite as much alive as myself to every precaution for the preservation of the health and comfort of their men, but to show what a very difficult position a man of common sense is placed in, when he accepts such a command. He can hardly be deemed a free agent; he is pestered by assertions that such was the course Captain H. pursued; and if he either doubts, opposes, or varies from these self-constituted Mentors, he must look for sulkiness, opposition, and the petty mutiny of petty minds. It is this underhand tyranny attempted on the chief, that has made so many officers declare "that no inducement would bring them here again." It is the duty of every man who may command such service to institute a full and complete inquiry into all its workings, and, if able, to afford such information as may be of service to his successors.

But such matters are not merely to be confined to Arctic vessels. The same principles, narrowly watched, are involved in every ship and every private dwelling; it is a sanitary question, and must stand on its philosophical merits alone. I do not, at this late period, begin my reflections on these matters; I carried them out successfully between 1830 and 1833, three years and a half, on the coast of Africa, without the loss of a man, and have been generally successful in other ships. Another season may afford different results; I will then—stubbornly, no doubt some will say—put in practice my own views. Doubtless this work may contain many theories not at all in accordance with the views entertained by

those luxuriating in warm studies in 52° N., with a temperature of 76°; but it is my business to present facts, and very stubborn facts too, with the apparent causes in operation to account for them.

The washhouse brings me back to the fact of its rent at the gables, the sides being parallel to the beach-line. One fact is worth a thousand theories, and such a fact, too strongly pressed on my mind, placed me in great doubt as to the fate of my Observatory,—that is, should the ice march up-hill, and imperceptibly slide it over its gravelly foundation, or disturb its level in the smallest degree perceptible.

In order perfectly to understand my fears, I may as well exhibit my view of the causes which, throughout the Arctic seas, in perfectly sheltered as well as exposed beaches, produce the lower terraced levels at, and immediately above, the flow of the sea. In a pool, land-locked, possibly never sea-washed, by reason of a very narrow belt of water showing only in summer at high water between it and the then floating ice, it is evident no such mode of throwing up gravel in complete tidal strata could be effected, nor even in exposed beaches has the sea any such action, for similar reasons, viz. want of water in sufficient volume, or range, to raise these tidal or beach lines. When I first entered these regions, this matter engaged my attention from the summit of Cape Spencer to the beach. The only rational mode then appeared to be the melting of snows,—the formation of successive terraces, confining the water, and its successive similar steps, until it reached the sea. Since then I have thought more, and seen part of the lower operation in action;

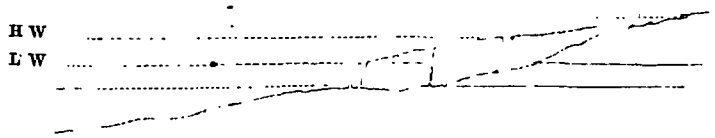
and I have rejected all the former conclusions, because these are *not* invariably, even in winter, "snow-clad" regions! The discussion of the causes operating on upper levels must be referred to other authorities and forces, and, as far as I know, must ever remain theoretical; no proof can exist.

The first cause is plainly illustrated by pressing a flat board, having a smooth rectangular edge, against a slight ridge of sand on a table: this will produce the first ridge, or terrace. Possibly the inner edge of the board may rise, and slide up the sand some inches: comparing great things with small, this is Nature's first movement here. The fine bay ice, say six inches thick, forced very slowly by millions of tons weight and impelled by wind or tide, presses on some beach, a noise like that of a rushing wind is instantly heard, and ice is noticed travelling up the beach, forcing before it all the light gravel. This of course *planes* the subjacent matter. It has possibly removed one great shaving, and the upper abutting gravel resists but for an instant,—it buckles, breaks, and turns up, forcing layer after layer, and "piling" the beach until the motive power is arrested, possibly miles distant! This is Act I.; it may be repeated, and the successive forces, possibly with planes of four feet in thickness, do their work with unerring certainty, until arrested by the general freezing of such a mass so accumulated on the shore as will compel the outer ice to buckle, break, and pile, overwhelming the strongest works of man. These are plain, unmistakable facts. The spring thaws reveal these facts—these apparently "tide terraces," and leave new comers to dream of their origin.

Such an operation of Nature at the beach, and particularly in our situation, would inevitably destroy the Observatory, perhaps leave no hope of saving the instruments; but this I did not anticipate now. The bay or land ice had formed, and the planes for this season would not in all probability be disturbed to any extent; but it was to be feared. Another cause in daily operation, and acting to the same end, was in quiet, irresistible action: this was the tide. If the elder Perkins is alive, he may remember explaining to me his earliest invention, the cotton-pressing machine; I think it may still be seen at the Polytechnic Institution. Such is our tidal ice-power, the "taking up wedges" being the snow-drift, etc., which fills in as the tide opens the various fissures following the contour of the coast margin.

Let it be conceded that a great and continuous space at high water is frozen, and that the established winter ice, grounding daily in sixteen feet water, causes gaps varying from one foot to six inches, in contour lines corresponding to the depths surrounding the land. It must be evident that these gaps, if filled up, must at each returning high water (twice daily) force the in-shore ice up the inclined plane equal in amount to the interposed compressed matter. This we found it did, until the heavy ice formed, to guard the in-shore line which it had taken up. Then these gaps presented another feature: they turned up, or rose above their in-shore grounded pieces, causing, wherever resistance offered, unpleasant barriers. The upper crack of the ice-line ceased about six feet from the Observatory steps. I cannot state precisely how many yards it was from high-water line

when I selected the position, but it certainly was six feet above the level of the highest tide.



Supposing the upper line to represent high water; the second to indicate the thickness of ice; next, the centre line to indicate low water, and the third its under surface of ice; the breaks on the shore would indicate the natural causes operating to crack; the upper dots, the early stealthy movements up-hill, as evident in tidal pools.

The preceding matter may be dry, but I am not aware that any previous navigator has attempted to explain the causes in action; and if I merely succeed in drawing the attention of enlightened men,—not of those irritated by the truths which demolish their theories,—I am fully repaid. I cannot say, *Ex fumo dare lucem;* but they may blow the smoke from our eyes by enlarged discussion.

That the floe had moved *in-shore* I had absolute proof before I finally removed the tide-pole; when it was placed, it had an inclination *seaward,* and the pole was at the back of the hole; when removed, it had about the same inclination *in-shore,* and we had to cut away the outside part of the floe: this would not afford at that spot, afloat, more than one foot. One very curious fact was the depth to which we had to dig to get out the triangle legs,—three feet perpendicular. The question then arose, where does the increment take place in freezing? I am inclined to think, in the early season, both

ways,—upwards by evaporation, and below by the customary process of freezing; but here again we have a very stubborn fact to contend with. By all the experiments made, until I became sick of reported breakages of thermometers, I could not detect a well-attested difference between the temperature at the bottom, in seven fathoms, and that at the surface. If heat ascends, and the cold will not descend through ice below 32°, the sea preserving 29° to 29·5°, why does it not freeze to the bottom? and why does it accumulate on ice freezing at 28°, but only at 32° when frozen? Our experiments have not resolved this difficulty,—every trial has been marred by some mistake.

Cubes of Ice.—Experiments were now commenced on cubes of sea-ice, and, as the thickness increased, they were extended to the mean upper, mean centre, and mean lower masses. Nor did it cease there. These cubes, duly numbered, were exposed to the upper-deck temperature during winter, and weighed at particular seasons to determine their changes by exposure, evaporation, etc. The water resulting from thawing these respective divisions of the ice was bottled, as well as that at the surface, for future examination. The atmospheric air, in well-dried, stoppered bottles, and covered with leather and bladder, was also obtained.

On the 25th of October, a cubic structure was formed with snow bricks, of twelve feet in length, ten wide, and six high, the crevices being sealed with snow and water. In this mass five Six's self-registering thermometers were inserted, equidistant in height as well as lateral distance from the air, as follows:—

No. 1. 5 feet deep and 5 from the side.
2. 4 „ 4 „
3. 3 „ 3 „
4. 2 „ 2 „
5. 1 „ 1 „

A hole had also been cut into the rocky soil, in which a wooden tube four feet in length was inserted, in order to determine the maxima and minima during the winter season. But, to my surprise, I found that it had been registered with the other thermometers daily. However, it was finally sealed and secured from further molestation on the 28th of November.

On the 27th of October, the sun should have been in bed; however, I could not resist "one last, fond look," and as he displayed his countenance for the last time, his altitude was observed, giving about 31′ 31″ 5‴ refraction.

Our winter had now commenced: the thought brought with it many last expressions on quitting home, connected with the return of that luminary, not easily forgotten! This is not a region to chase away such intrusive reflections; but they only nerve us, perhaps, in remembrance of the many mottoes, to persevere, to do, and possibly, to deserve.

Dates will now pass rapidly, although our time will be completely engrossed by matters too tedious to detail and too heavy for the general reader. I shall therefore go back to the before-mentioned washhouse, where I found that Commander Richards held some mysterious meetings, which seduced from their allegiance several subjects of my Observatory. It was too cold and dreary a spot for me to pry into. At length however the murder came out: he had become the Sole Lessee and Director of Her Majesty's Theatre Royal, and had there

established his *green* (?) room. In due time the clattering of carpenters and other *employés* rushing to and fro was heard; and, near the commencement of November, the following play-bill, printed at the Royal Press, on satin, was placed on my table, ordered to lie there, passed three readings, and received due assent, the Lord Chamberlain having no objections thereto.



UNDER THE DISTINGUISHED PATRONAGE OF

CAPTAIN SIR EDWARD BELCHER, C.B.

COMMANDER G. H. RICHARDS, of the ROYAL ARCTIC NAVY, (*the Sole Lessee and Manager,*) has the honour to acquaint the Nobility and Gentry of North Cornwall that he has, at a considerable personal sacrifice, and with the *almost* sole view of contributing to their entertainment, engaged a highly select and talented *CORPS DRAMATIQUE*, and has entirely rebuilt and re-embellished the Queen's Arctic Theatre,

and that on the *Ninth of November*, being the birthday of

HIS ROYAL HIGHNESS THE PRINCE OF WALES,

DUKE OF CORNWALL AND EARL OF DUBLIN,

will be performed, for the first time in this country, the inimitable Comedy of

THE IRISH TUTOR.

FLAIL ..... *Mr. GROVE (of the Argyle Rooms).*

CHARLES ..... *Mr. ALLARD (of the Royal Pioneer Olympic).*

MR. TILLWELL..... *Mr. LEWIS.*

TERRY O'ROURKE, DOCTOR O'TOOLE } *Mr. HERBERT (the* Power *of the present day).*

ROSA..... *Mr. CHEYNE (an Aurora of the first water from Sadlers' Wells, where her performance electrified the audience).*

MARY ..... *Mr. HARWOOD (her first appearance on any Stage).*

Villagers, Peasantesses, etc. ..... *British Seamen.*

To be followed by

A MUSICAL INTERLUDE.

GLEE, See our oars like feathers play.... { Mr. J. GORE *(celebrated Arctic Vocalist).* Mr. HARWOOD *(from the R. P. O.).* Mr. J. MACARTNEY.

DUET, The Queen's Coachman, Messrs. R. & I. HALES *(from R.P.O.).*

SOLO, Ireland ..... Mr. J. MACARTNEY.

NAUTICAL HORNPIPE ..... Mr. A. DICKENS *(from the R.P.O.).*

After which, at the *express desire of the Ladies,*

The perfect Farce of

THE SILENT WOMAN.

MR. SANDFORD.... *Dr. RICARDS.* ARTHUR.... *Mr. GROVE.*

MARIANNE.... *Mr. CHEYNE.*

☞ The Queen's Own Band will be in attendance, and a MAGNIFICENT DROP SCENE is being painted by that celebrated Arctic Artist,

MR. WALTER MAY,

for which an overflowing house alone can in any measure remunerate the *Sole Lessee and Manager,* who takes this opportunity of repeating to the Public that he is actuated by no feeling save that of contributing to their amusement, *and realizing a competency for himself against increasing years and infirmities.*

The House will open at 6.30, the Performance commencing precisely at 7 o'clock.

Tickets may be had of H. BRIANT, at the Arctic Printing Office, Winter Quarters, Northumberland Sound.

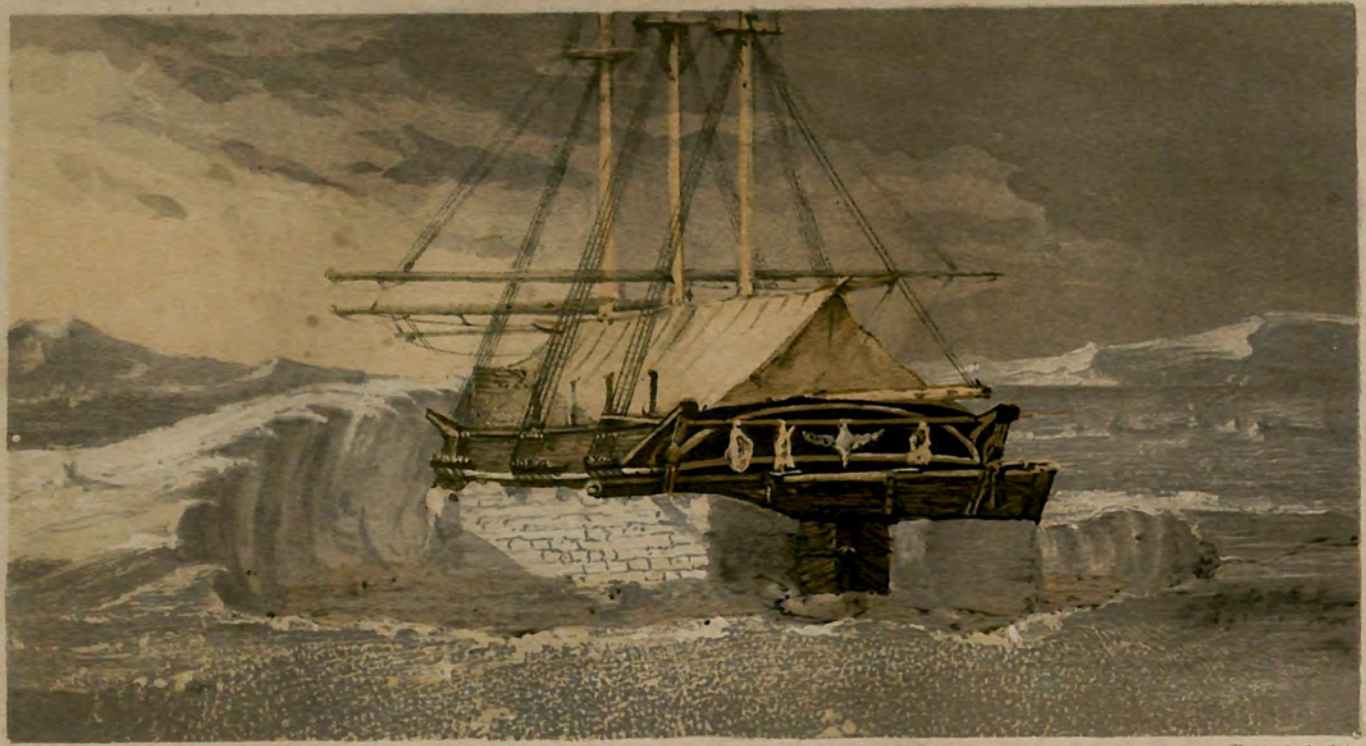
BY AUTHORITY.] [H. Briant, Printer.

One authority however had not been consulted—it was too late—it was the Clerk of the Weather! I am informed that the very same mistake occurred "last cruise," on this identical day too; therefore the "old hands" were to blame. One thing however settled the matter—it could not be put off—it was to open on the occasion of the anniversary of the birth of His Royal Highness the Prince of Wales and Duke of *North Cornwall.* Blow it might, and do its worst, and blow it did.

As the Play-bill intimates, the subjects selected were 'The Irish Tutor' and 'The Silent Woman.'

The theatre was got up with considerable taste, and every character admirably supported, even to a most troublesome one-eyed pie and ginger-beer man, who most pertinaciously chose to present himself at the Royal Box. *He* knew full well Her Majesty and the Prince could not travel this weather; indeed, he had heard the apology from the Lord Chamberlain read by the Sole Lessee, explaining the cause, and intimating her most gracious pleasure that the men should not forget Mr. Allsopp, which latter sentence was received with thunders of applause. As to hearing anything, Boreas had it all his own way; it lay principally between him and a Woolwich waterman politely intimating that "the last boat would start *posa*-TIVE-ly at eleven."

As we were unable to hear, it is almost needless to add that the excellence of the acting entirely superseded the noise of the tempest; and between it and the music, of which 'Cease rude Boreas' could not be heard, and but imperfectly understood by the tremulous fingers of the musicians, the evening terminated satisfactorily. The manager, being most *loudly* called for, at length appeared,



Z.B. del. Vincent Brooks Lith.

Snow Wreath, Northumberland Sound.

and, having overcome his modesty, made a very taking speech, not omitting Allsopp in conclusion, and retired, promising to omit no exertion to please at a more propitious day.

The temperature during the performance may be assumed as near 17° as possible. This would be warm if calm, but the breeze in the boxes made it cutting: nothing but the most determined loyalty rendered it endurable.

This gale came on with the thermometer at 20°. On the 8th it fell to 10°, at noon on the 9th to zero, and rose as high at the Observatory, when we had it at 17°, in the theatre, to 20°, at least so I find it recorded. The tide-gauge rose one foot above its scale, and I have reason to believe that some movement of ice, unperceived by us, shook the Observatory.

On the 10th of November the gale continued with unabated violence, cutting off all communication with the shore, the temperatures ranging from 9° to zero, rising according to the strength of the wind. A heavy snow-bank formed on our port side, but the reaction of the wind against our side caused it to maintain a respectable distance, channelling out a nice sheltered walk for our men in future, and raising a most picturesque, ornamental snow-wreath as a permanent overhanging wall, distant about sixty feet from the ship's side, and level with our upper works, or about fourteen feet above the ice. Between us and the 'Pioneer' a huge wave of snow intervened, nearly on the upper level, and extended up to the shore, tapering to nothing. This weight of snow caused the water to flow up, which, when solidly

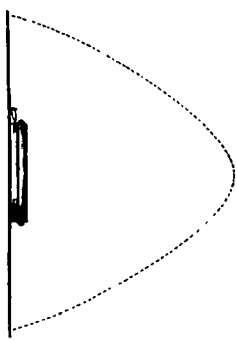
frozen, formed a level promenade about six inches above the ice. Thus from every evil some benefit results, if we be only disposed to view matters as boons of Providence. The fissures in the ice, both in-shore and off into deep water, were also more numerous.

I have before noticed that this is not a snow-clad region,—that is, the land,—and this morning has verified that observation. The gale has denuded the entire coast, except in the ravines, where it is almost perpetual, bridging over the watercourses, where, during thaws, the water flows with rapidity beneath.

To-day, the 14th of November, the gale abated. Yesterday the Master had been able to extricate the chronometer from the Observatory, and had I been aware of his intention would have prevented it. The opening the door to-day was attended with a kind of mysterious feeling, difficult to describe; but a solemn, unaccountable oppression, similar to entering a long sealed tomb, weighed upon me, and yet there was literally nothing more than the dreariness attending the effect produced by any house overwhelmed by snow. The sensation was similar to the exploration of a cave, the work of ages. The scene before me was however one of Nature's immediate recent acts. I must say that it afforded information, experience, and matter for reflection: what more can I add?

The scene before me was new, and, as connected with my instruments, charged with deep interest. In our external portico the aneroid barometer, the wet and dry bulb thermometers, and some maximum thermometers were placed. Be it remembered that this was a portico,

composed of canvas, and the vibration caused by the gale against the planking which supported the instruments, might be supposed to militate against the formation of any fragile accumulation of impalpable "barber" or snow dust; "barber" meaning truly, the immediate condensation of the vapour arising from water at the point of condensation, and blown upon the beard,—or the natural condensation on the beard of the exudation from "the animal." I do not admit that the term is Arctic. I knew it—as all my old friends who preceded me some fifty years ago—as the well-known "barber" coming down the narrows of the basin at Halifax, Nova Scotia. Entering this portico, instead of the aneroid, a light cone presented itself, having the aneroid as its base, the base and frustum of the cone of snow being about two feet each. This, although of such light material, did not yield easily: but by the repeated application of the snow-brush I gradually cleared away the snow, and rescued the instruments unhurt.



The next was the Observatory, and this I almost feared to enter, for the doorway presented difficulties

which puzzled me. The standard barometer, previously coaxed into the performance of its duty, was evidently damaged, and the snow prevented any force being used to open the door. The mercurial column had fallen below any rational range, and I was therefore prepared for the worst. On brushing off the snow I was satisfied that either the concussion of forcing the door (by Mr. Nobody), or the snow getting between it and the tube, had strained it near the cistern, a portion of the mercury escaped, and it was rendered useless. Brushing the snow off each, I had to congratulate myself, on quitting this chamber of horrors, that I had lost but one instrument, and that was one in which I never had confidence, for it lost mercury before leaving England. But the pressure of the gale had been so heavy, that every possible crevice, by which *air* could enter, was beautifully fringed by deposits of impalpable snow-wreaths. These hints were not lost, and the proper remedies applied.

CHAPTER VII.

Transit Telescope.—Extremes of Cold.—Effects of the Gale.—Remarks on Equipment.—Sensations of Cold.—Paraselena.—Schools Established.—Society of Loyal Arctic Engineers.—Deflections of the Magnetometer.—Experiments on Freezing.—Ice Crystals.—The Aurora.

I HAD shortly before this constructed a fixed transit telescope, by fitting a good two-feet with the necessary wires, and setting it, by our final observations, in the meridian. The results were dependent on the stability of the house, and of this now I had no further doubt. In few words, intelligible to most astronomers, I selected from Baily's Catalogue one of the principal stars which would, with others of a nearly similar declination, pass the wires throughout the winter, so as conveniently to afford me times for five- or ten-day comparisons, and thus verify my rates. Selecting 13 γ Pegasi and 1970 α Herculis as my standard stars, I possessed a range of seventeen hours to work upon until April, with all the intermediate stars, some of which happen to be more numerous than the Catalogue gives any notice of, but which are of equal value, unknown, for the mere purpose of rating chronometers.

On a decided change of temperature between the 5th and 10th of November, I had firmly relied and expressed my opinion. On the 11th I did expect that gale, and I further expected a cessation of intense cold from that period until the 22nd December. This is not the result of a mere guess, but of a long course of observations in North America, and wherever cold predominates, that there are three periods of cold,—one in November, ranging between the 5th and 10th; a second in December, 22nd to 30th; and the third in March, near the 10th. These periods generally exhibit the extremes of temperature. Of gales I take no special notice, but here they inevitably accompany any undue *rise* of temperature. These remarks led me to institute an inquiry, or constructing a table of comparison of the temperatures experienced by Parry, Ross, and Austin, to which will be added our own, and possibly those of the other ships composing this Expedition. I think that the scales will bear out my observation.

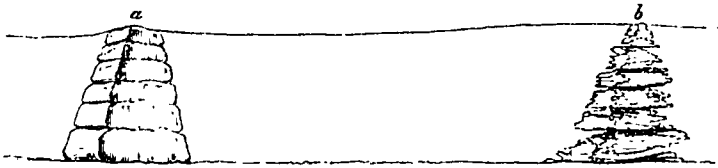
I notice in Parry's Second Voyage, that he relates, "that the first week in the month of November the weather was mild; the temperature then fell to −30°, which change we felt sensibly." This extreme is not much exceeded by this month. His severity of mid-winter commences about the 26th of December, continuing to the 9th of January, and reaching about −45°; on the 10th it is +4°, and continues −. Towards the end of February cold increases, and up to the 11th of March it is −36·75°: from this period (as elsewhere) intense cold ceases.

We have yet to record the result in this *terra incog-*

nita, but I feel confident in the average result that the law will hold good, tides, winds, etc., taken fairly into account. To-day, 15th November, after inspecting the drift banks which seem to have their points of concentration between the stern of the 'Assistance' and the bow of the 'Pioneer,' I ascended the hill commanding the anchorage (Mount Beaufort) to examine the effects of the late gale. It was now denuded, not a place on which to impress a footmark. And yet, some few days since, on this very ground, I had watched the operation of cutting "bricks" for building from this same spot, then a bank of solid snow preserving an average clear depth of one foot, and capable of bearing my weight; the entire depth was about three feet. Some estimate therefore may be formed of the unceasing force and scour of the wind and drift snow, from the perfect denudation of this peninsula, and indeed of all the visible outlines of the land. It required but one bright return of that absent sun to shed his rays on the landscape, and ideal spring would gladden our eyes. As I reached the summit I was yet more surprised: there the denudation was complete; every opposing obstacle had been overcome, and I at least imagined that on the slope of the opposite declivity the common laws of Nature would be observed,—that a deposit would be found. Not a vestige of snow remained, and if any difference existed, it was more denuded on that side, even to its very base.

It was amusing to observe its effects on all the line of supports, or snow pedestals, of the electrical wires. They originally stood complete, as at *a*, but were now reduced

to the skeleton shown by *b* in the diagram; others were mere remnants.



About this period I gave way—to the snow and gravel covering on the decks; not from conviction, but for peace and quietness. To Commander Richards I do not ascribe any such feeling of pressure; but he was evidently worked upon by constant dinning, elsewhere, into the belief that it was his duty to urge me to satisfy this "former cruise mania;" and if any *fancied* themselves warmer, the object was gained. The Sylvester would not act, and I very much regretted the absence of Perkins' hot-water tubes, for those I knew how to control—they were fitted in my own house, in the 'Terror,' and I could *command* their services up to any temperature. Knowledge is power; but no knowledge here could make Sylvester's apparatus work without an enormous consumption of fuel; and let it be remembered, that in both these vessels it failed on the late Expedition. On the other hand, I know that with Perkins the difficulty consists in moderating the *heat*. It is a matter beyond controversy, that if the initial heat is generated in Perkins, it must pursue its course throughout its coil, and distribute its heat before it returns to the furnace; but Sylvester dis-

dains the cabin, or of reaching many feet of it, nevertheless carefully conveying all offensive effluvia, tobacco smoke, etc. Not that I disagree with his principle, but that he cannot carry it out; he cannot, more than ourselves, demand that we should sail by the *head*, to give his *current ascent*. But the matter will be more thoroughly sifted (under very different arrangements) next winter.

November 28.—The increased thickness of the ice, and consequent gradual rise of the ship, prevents the tide-gauge from acting correctly, unless indeed the entire frozen surface does not permit the due flow of tide. The difficulty, and incessant labour also, of breaking away the constantly-forming ice, is too much for the men; I have therefore put it out of gear until spring. Our attention is now principally directed towards the general equipment of the spring travelling parties, and we begin to find that these matters should have been cautiously considered in England, and not left simply to the mind of one, but of a board of officers. Indeed, I do not think that any part of the equipment comes properly within the province of a seaman; it is much more that of a ship-broker and the higher classes of tradesmen. The delay in appointing the officer who is to command—until too late to make much more than his own equipment, and barely time to complete his ordinary duties, independent of any preparation of scientific instruments—militates sadly against the interests of such an expedition. I can safely say that very few of the leading officers, including myself, were properly equipped, nor could we learn, from any reliable channel, what was

required. Every one had his opinion, and kept it for his own use; we now *know*, and *feel too*, what is requisite. If time had permitted, I could have had the opinions of the best practical men: lighter, better, and cheaper clothing would have been prepared for every individual, and submitted for approval; the tents would have been adequate to preserve life, if wrecked, and yet lighter for travelling; the stoves would have been serviceable now and hereafter; the sledges would not have been constructed of soft Canada elm in the dockyards, but of lance-wood, by some intelligent carriage-builder, and shod with steel instead of soft iron: they would have cost Government less money, and any North American knows well the value of his polished runner. Steel will pass over stone easily, and not be bitten; iron is worse, copper worse still, and lead, to the meanest capacity, a dead drag. As regards the boots—these are now really so much matter of general supply, from the days of Parry to the present, that it would be almost mutiny to disagree upon such a subject; yet they are far from waterproof, and for wet work, if properly made, they are indispensable.

But the "travelling boot" is of more importance—everything is at stake here. We are totally unprovided, simply because we trusted. "Who from faults is free?" We might, had the travellers of last cruise made known all that has now leaked out, and given us the result of their experience, have been ready for the field; we are at present totally unprepared, and with one shoemaker and some sailmakers closely engaged making canvas boots with leather soles: some have been made of the

seal-skins* obtained at Greenland, but that they will not last we can plainly see. They are like our seal-skin dresses provided in England, offensive even to talk about. Those purchased at Lievely have turned out better: necessity there has taught them the proper mode of curing the skins, and they are thin, light, and flexible. A preparation of Mackintosh and linen or silk externally, and fine, close, light cloth within, would have been infinitely preferable. Further, every article of clothing has been mis-supplied: nothing to fit, and therefore nothing comfortable: and not a tailor on board to alter! Of this the Government has always been kept in ignorance, and the routine has been perpetuated under the several commanders of these expeditions. The old principle, established in well-regulated ships about the year 1821, of allowing a certain number of contractors to fit the men, muster them before pay-day, and deposit their ticketed clothes until the First Lieutenant saw they were paid for, and the duplicate taken for later distribution, could easily have been pursued here, and would have afforded great satisfaction. I was measured, it is true, but my clothes never were intended for a man under six feet, and plenty of room in arms and chest for very extensive smuggling. Fortunately, I did not reckon on the gratuitous supply, and obtained one warm ship suit; that for travelling I was lucky enough to obtain from the Governor at Lievely.

To myself all the blame is due, or rather to my want of opportunity or time to look after other even more im-

* These seal-skins were specially obtained for this purpose at Greenland, but were totally useless for such service.

portant matters. Many expenditures of the public money, I now perceive, might have been avoided, and space saved for much more important stores. From the proper departments at the Admiralty every facility was afforded, but many supplies would, if I again controlled a fitting-out, be entirely expunged.

How habit changes the feelings!—not clothing, for I have not changed the ordinary suit which I donned on reaching the Orkneys, and even in travelling have merely added the Lievely seal-skin trousers. Not many weeks since, 20° was considered very cold in our tents; and we were reduced to melt snow to drink, about the 1st of September. Another month,—about the 1st of October, I well recollect, being then in jeopardy, and the leaders of this Expedition cut off for a time,—our anxious prayers were offered for a temperature of zero, or even −10°, in order to freeze the sea intervening between us and the mainland, and enable us to travel. Even then we did not feel the cold. About the 16th of November I noticed apparent disappointment that the mercury had risen to 15°, and on the 17th to 20·5°. One hero, in my mind's eye, appeared to repent of his coming to a climate where he was not to have "constant exercise and training" to aid him in his preparation for his contemplated march in the spring, with a temperature at −50°! but I very strongly suspect that my hero, if unfolded, as the clown's baby was, would be found prepared for the worst,—sundry rolls of flannel to make the man.

For my own part, I feel the cold, at times acutely; it varies according to the state of health; but I fear it not, and must candidly express my wish to experience, in

my own person, provided as we are with such a perfect set of instruments, the lowest temperature yet registered by reliable instruments and observers. I shall then be able to afford my humble opinion as to its effects. This is not foolhardiness, it is solely the pursuit of science; but I have no wish or intention to brave it by any unnecessary exposure. I merely hope that the minimum temperature may not occur when I am in bed: I should be strongly inclined to defer its registry until I saw the minimum gauge in the morning.

November 30.—About this period the season becomes extremely monotonous, and one is reduced to all kinds of imaginary reasons to account for the absence of expected phenomena, more especially the aurora, for which every kind of solicitation had been adopted; from mast-head to mast-head of ship, as well as 'Pioneer;' thence to the shore; up the hill; along the hill, on elevated poles; indeed, wherever it could be supposed to pass, there a trap was in readiness. Possibly we had overdone the business, exhausted the atmosphere, and it had not wherewithal to support itself, or held aloof at least from combination with our protected neighbourhood.

The Crystal Palace, constructed as the *sanctum sanctorum* of the electric operations, had shared the fate of such castles,—had proved too heavy for the floe, subsided, water flowed in, and the gale of the 9th November had almost obliterated the site!

This evening a beautifully defined paraselena was observed about north-north-east true. By measurement with sextant the interior circle was found to have a radius of 22° 10′, vertical as well as horizontal; the ex-

terior 44°; the moon's altitude at the time about 30°. This beautiful phenomenon was represented by two concentric halos, incomplete near the horizon, accompanied by two strong crucial rays, vertical and horizontal, having the moon for their centre, the moon at this moment being four days past the full. It was also accompanied by arcs of other eccentric circles, having their common centre at a point within the zenith. The greater of these intersected the moon and outer halos, forming, at their contacts, luminous spots. So nearly did this represent the rectangular crucial form at the moon, that it was only by following the lower rays of the greater eccentric halo that they could be traced to be really a segment of a great circle. (See Plate.)

At the points of intersection of these halos, bright paraselenæ, forming five on the lower and two on the upper arcs, presented themselves; the moon and the intersections by the vertical ray, exhibiting the most luminous. The second eccentric circle did not intersect, at any visible point, the outer halo; but where the outer eccentric and vertical cut through the greater concentric, a sort of luminous nebula appeared to vibrate, affording an impression of the effect of an aurora. I did not, at the time, consider that it could in any manner have any connection with the aurora or electric influence; but, on examining the magnetometer register, I found that between nine and midnight the instrument had been deflected from 124° to 134°, 110° to 125° being the customary range when nothing is noticed likely to be of interest. In consequence of the visits of very faint aurora, and other disturbances of the magnetometer, fresh



Lieut. May del. Vincent Brooks Lith.

Paraselena, Nov. 30th. Northumberland Sound.

instructions were issued, "to note every deviation above or below 125°." A similar phenomenon, but on a much reduced scale, and not nearly so brilliant, occurred the night following. The magnetometer exhibited symptoms of undue disturbance between the hours of eight P.M. and thirteen (or one A.M.).

To the pencil of Lieutenant May I am indebted for the very interesting sketch of the subject under notice, as well as of the ship and tender at our winter quarters.

On the forenoon of the 1st of December the southern arch of the horizon became considerably illuminated,—equal indeed to our tints in lower latitudes before sunrise in March, and exhibited a very beautiful illustration of the effect of intense cold arresting the upper currents of air. This representation was so perfectly defined as to produce hard lines on the edges of the clouds, on which the fancy would frequently trace ideal figures. In one particular instance they seemed to be a collection of



the various outlines of the summits of the land, and to be forced into rounded forms, as if impelled by a furious gale.

Under this dark-coloured sky the distant land on the

southern shore, near Cape Lady Franklin,* was peculiarly refracted, and appeared to be considerably nearer than our positive knowledge would warrant, displaying very beautifully its particular features. A delicate salmon tint pervaded the horizon, affording the pleasing idea of a March sunrise in England. Our climate here, as far as we can judge from the journals of our predecessors, differs considerably from that further south. It is drier, clearer,—I would almost add, superior,—to that we read of; but this, I imagine, results from a freer scope of air. On board I find the 'tween-decks very wet and uncomfortable, extending from the after-gunroom bulkhead to the bows. My cabin is particularly dry, the ice in all the inaccessible crevices of the after-storeroom, abaft it, absorbing greedily the little moisture which may arise; all the bulkheads and furniture cracking and splitting with loud noise, at the same time attended with some difficulty in maintaining an even temperature. The wet between decks, resulting from cooking, breath, and drying clothes in the main hold, cannot by any present arrangement be remedied.

December 1.—Our first amusement was the theatre; this was followed by a newspaper; but something more useful and solid was required. We therefore established the evening schools, and not having sufficiently, or at all, prepared for this important matter by the customary Government supplies, the requisite paper of which to form writing-books dipped deeply into our supplies. Three classes were formed:—first, those who could read, write, and calculate; second, those who could read and write

* The new Cape Lady Franklin.

only; third, those who knew nothing; and very satisfactory progress was made, thanks to the supervision of Commander Richards, Mr. Loney, and Mr. Lewis, who handsomely offered their services.

As there seemed yet to be a vacuum, I proposed the incorporation of the Loyal Circle of Arctic Engineers, to meet on Monday evenings, read some interesting matter from standard works, or produce a paper upon particular matters immediately connected with our operations, present or intended. My object was to enable the diffident seamen to stir themselves by a course of study which would enable them to enter the 'Excellent' with certain acquirements. It is not the province of the Captain to take the lead in such matters beyond the suggestion, and I expected, if the direction could once be brought to move in the right road, it might induce those to think who never thought before, and perhaps seek to solve the meaning of expressions to which they were not accustomed. It was a rational exercise of the mind, and unless some one set the machine in action, the wheels might become so much clogged (by sleep) as to be inert when required.

There was another great object which I confess I had in view, and that was the discussion, at the moment and on the spot, of many particular subjects of great interest, and to stamp them by some mark of authority now, so as to prevent, at any later date, any theoretical fireside discussions in England, where they might not be properly refuted. Opposition and discussion *here* would secure proper tests, would induce each party interested to collect facts; and thus our records would become valuable,

and the minds of all better adapted to register, in fit terms, the forthcoming adventures of travel in a manner befitting the importance of this Expedition.

Finally, as regarded our little community, it afforded amusement, occupation, and instruction to the crew, all of whom were invited to produce papers upon any matters they pleased. In order to facilitate this object, I drew up a set of subjects, on which papers would be invited, and endeavoured to include every capacity, even to humorous matters, for which certain medals, "when engraved and struck," would be awarded. Having been elected President,—indeed fearing that it might altogether fail if I did not start the vessel, I commenced proceedings by delivering my address, and we contrived to continue our meetings during the winter, or truly to drag its lazy coil along, until superseded by the preparations for sledge travel in spring.

"Notice is hereby given, that a Meeting of the Royal Society of Arctic Engineers will take place on *Monday Evening next*, the 29th of November, 1852, in MAIN HATCHWAY SQUARE, when an Original Paper, '*On the Construction of a Lamp for the Cooking Apparatus of the Travelling Parties, to burn the fat of Animals slain in the Chase*,' will be read by Mr. HARWOOD, of the 'Pioneer.' The President in the Chair. The doors will open at 6.30 P.M. precisely.

"G. H. RICHARDS, Secretary.

"The Temperature to be preserved at 42°."

At the period of the spring tide in the early part of this month, a very extensive crack, following the contour line of the peninsula beach, opened about half-way between the ship and the shore, computed to be in about three fathoms, caused probably by the very great incre-

ment of drift snow preventing the floating or curvature of the ice at the crack, where it appeared to be very thick; it gaped about eighteen inches above, but it was too close below to admit of measurement.

On the evening of the 2nd of December, about nine P.M., the first well authenticated aurora was observed. All our instruments being then available, I was anxious to ascertain its effect on them. Mr. Cheyne was directed to report on the electrometers, and I add his remarks, as I believe he was called in time to see it in part.

"SIR,—Last night, at 9.20, I observed an Aurora: a light narrow streak extended from the summit of the Observatory Hill, passing immediately through the zenith, in a direction south-by-east true, terminating in a feather about 25° north of the zenith (?). Four cumulus-shaped masses appeared as though only about a couple of hundred feet from the mast-heads; these masses lasted about three minutes, and then suddenly disappeared, having apparently shifted their position about twenty feet during that time; the long streak gradually vanished in about eight minutes.

"The magnetometer read 116·50°, was perfectly steady, nor was the electrometer in the least affected. The sky was perfectly clear.

"(Signed) J. P. CHEYNE, Lieutenant.

"December 3, 1852."

Mr. Cheyne was not an observer: he probably took this 116·50° from the register for nine hours,* which is there so recorded, but he could not judge of the steadiness of the magnetometer: at eight it was 117·30°; at ten, 120·60°. But it is not clear to my mind that it was not affected, and that the causes which produced this aurora had not been in action the last eight hours, viz. from four P.M. until midnight, when it reached

* All terms of time refer to astronomical periods from noon to noon.

137·80°, equal to 27·60 of deflection, a disturbance not before recorded; even between nine and midnight we have a deflection of 21·30°!

The barometer, during the interval between eight and midnight, suddenly changed from 29·860 to 29·650, regaining its height, and rising to 29·900, when the magnetometer at sixteen hours showed 107·90°.

I had almost begun to conjecture that we were in too cold a medium, or that it might not extend to so high a latitude. Considering, too, that its first appearance generally occurs with the first shades of winter, I could hardly understand its prolonged absence. I had observed it, to the north of Behring's Strait, on the 25th August and continuously up to the 5th October, in its greatest brilliancy; and in Wales, at Swansea, in August. But I notice that Parry, in his first voyage, and nearest to us, did not record it until the 8th of January; on his third, which follows in order of latitude, in October and November; and in his second, in October. I did not witness it myself,—indeed it was not reported: I casually heard of it next day, and issued orders "invariably to call me." It was only on perusing the official report called for from Lieutenant Cheyne, that I was induced to search the magnetometer records for its motions.

December 5.—Another aurora, noticed this evening, presented vertical shoots or broom-like fasciæ, shooting towards the zenith (from behind the hill north-north-west), in pale flame-tinted rays, to an altitude of 20°. No disturbance was recorded, but it is highly probable that the variations registered at nine and ten P.M. are attributable to this influence. It recurred about midnight,

but is not indicated by the magnetometer: at noon it is suddenly deflected.

The *bonâ fide* winter does not appear to commence before the 1st of December, and about that period I observe that the walkers are more energetic in their exercise, and take to it more decidedly as essential to health than for amusement. I quite agree in this feeling, but deeming sundry wounds not easily cured, if I should unnecessarily expose myself, or meet with an accident, fit matters to be trifled with, am content to take that which the deck or light trips to the Observatory furnish.

On the 6th of December, being the last of our strolls, I noticed Venus to the south-south-west, refracted with extraordinary splendour; a complete Pharos,—a vertical ray exhibiting most splendid pencils of light. It was so well worth notice, that I called some of the officers out to witness it; but I found that, on ascending the side of the hill to obtain a better view, it dwindled again into simply Venus;—not the first one she has deceived.

A certain set of experiments were now made on freezing water; not simply to satisfy myself on this very beautiful phenomenon,—as all of Nature's works are when scientifically investigated,—but for the purpose of determining the amount of vapour thrown off during the progress of crystallization. For these experiments I used a very delicate balance, substituting gutta-percha vessels of nine square inches' surface for those of brass; they were half an inch in depth. I found it difficult to deal with even one drop, but, by the aid of a very fine capillary dropping (test) tube, and a shred of blotting-paper, soon adjusted my balance. The amount of water sub-

mitted to experiment was six drachms, distilled; and as the perfection of the balance could not be carried on in an atmosphere of −17·5°, the preparatory measures were conducted below. A kind of screened cabin was erected on deck for experimental purposes; the temperature of the water below = 56°.

Time 0h. 26m., exposed to −17°.
„ 0h. 31m. = 5 minutes, frozen, copious vapour.
„ 0h. 41m. = 15 minutes, hard, opaque, and raised.

The loss of weight = 5·725 grains. Left until noon following: no change. The same on salt water afforded 5·0 grains loss; frozen in 5 minutes, opaque in 7 minutes.

During the crystallization of the fresh water the effect was very beautiful:—first, the smoky lambent vapour, and then the shadows of the first shooting of the crystals, which were exhibited by a very powerful transmitted light, followed by the arborescence, until succeeded by the dull glare of solidity. Even then I could scarcely fancy it frozen, until it commenced the change to milkiness, and eventually, on rising in the centre, became quite opaque. I am afraid I shall not coax any of my fair readers to visit me, to participate in such experiments.

My next experiment was on a silk handkerchief,—I am not ashamed to say, belonging to one of the Banner ladies; it may yet be claimed, and passed as an heir-loom. This, being like its owner a delicate piece of workmanship, was well adapted to the purpose, as may be perceived from the weight. Weighed beforehand, it appeared without fault, but it must *go through the fire.* Its first weight was 7 drachms 9 grains, but after severe drying, unfolding, airing, and redrying, it had lost 36·5

grains; re-weighed before exposure on the lower deck—6½ drachms: in three hours it had absorbed 38 grains; in five hours, 36,—given up 2 grains; after hanging in my cabin twelve hours it had lost 8 grains. I fully intended subjecting this precious *morceau* to freezing proofs, but bad weather prevented this cruelty.

I do not think that any of the other processes carried on at this period, except the freezing of water in glass cylinders, are likely to interest others than those for whom they were expressly made, and which may possibly be placed in the Appendix.

Excepting Scoresby, few, I believe, have enjoyed the study of the forms of ice-crystals. I have ever felt deep interest in crystallography, as regards minerals, and mineral and other salts; therefore I could not but feel curious in watching the slow process of freezing. A very clean glass cylinder, about a foot in length and one inch internal diameter, filled with clear water at 50°, was submitted to a temperature of −24°: the vapour continued to flow off for a considerable time after the water was frozen, and the ice had elongated itself out of the tube (which was very strong).

During the process of freezing (as we may often observe in the crystallization of salts), I had the tube placed in the focus of a strong reflecting carriage-lamp, and was thus able to trace, on a white ground behind, the beautiful regularity of its every motion, from the first silvery thread to the total condensation.

I noticed that the crystallization commenced from below, and shooting its feather-like processes, signalizing as it were (with its arms at 60° above or 120° below) to the

surface; it in return replied by similar signal, and interlaced its branches downward at the centre. This was succeeded by a milky infusion, similar to that of water introduced into a solution of camphor in alcohol, and all became chaos. But I was not so easily satisfied; and repeating these experiments with salt water and at higher temperatures, I noticed that, as the point of general congelation approached, peculiar stars were produced, and rose to the surface, where they became attached to and formed the general mass. These stars were, I perceived, perfect detached crystals, similar to those we meet with in the atmosphere, and which belong to bright-weather snow.

At a subsequent date, on sending for sea-water from a depth, so as to be free from ice, I noticed that it appeared impure, and rejected it; but the next bottle was, if possible, worse. This induced me to examine it closely. I then found that it was all composed of these fine crystalline stars, the water being, at the moment it entered my cabin, at the point of congelation. But in very few minutes after, being influenced by a warmer temperature, its countenance changed, and beamed as bright as ever. Such we may observe constantly in port wine. I am afraid that many of us would under similar circumstances look very dull; but I know, from sad experience, that my countenance would undergo many very unseemly contortions under such treatment before it assumed anything like brightness: such would especially result from the pain of recovering from a bite of John Frost, Esq.

On the 6th, 9th, and 10th of December, further exhi-

bitions of aurora occurred, and some slight deflections of the magnetometer were apparent, but generally preceding or following.

About three A.M. on the 12th, the aurora was reported by the officer of the watch as very brilliant. But as I was comfortably in bed, and it was beyond my examination and would vanish before I could possibly be in a proper state to receive such a delicate visitor, I directed Messrs. May and Cheyne to pay every attention. It was Mr. May's guard at the magnetometer, and Mr. Cheyne was excused watch solely to attend to the electrometers, etc. It was asserted that the electric fluid was noticed on the wires *fairly caught; certes* Mr. Cheyne found no disturbance. I am not quite sure that he had his instruments placed in connection with his wires, or that he reached in time, possibly thinking as I did (?). Mr. May repaired to the Observatory, and unfortunately my later orders were not then in force, or we should have had a full history of this visitation. The magnetometer exhibited the most unmistakable signs of disturbance, moving instantaneously from 114° to 128°, and up to 150°, returning at four A.M. to 117·90°.

This, then, I consider as strong proof; and taking into consideration other very decided deflections, when no cause was apparent, I am induced to believe that the affection precedes or follows what may be indistinct, or not at all noticed by simple atmospheric observers, and nothing short of very close watching at the magnetometer will indicate the truth. But it must be borne in mind that this extra duty is a delicate service, and, to maintain even moderate interest, I know full well that the greatest

tact is necessary to keep up the importance of the operators. No "soft sawder" will do here: it is only by making the observer feel his importance, and in this aspect his responsibility to the civilized world, that he can be persuaded to extend his labours. Science will never be driven.

This aurora was reported "to have been duly captured, but broke the wires;" and as we could not find any of *her* (she has become a female) on the wires, and I could obtain no direct testimony (but the reverse) that Mr. Cheyne's electrometers were not influenced, the question remained *in nubibus*.

CHAPTER VIII.

Short Days.—Minimum Temperatures.—Warmth of Vessels.—A She-Bear.—Preparations for Travel.—Theatricals.—Shortest Day.—Christmas Ode.—Christmas Fare.—Depth of Winter.—The New Year.—Comparison of Thermometers.—Freezing Mercury.—Range of Extreme Cold.—Freezing Ale.—Alcohol at a low Temperature.

On the 10th of December our nights had become decidedly dark, and our small portion of day does not fairly dawn on us until near eleven, when it is about as bright as a September morning in England, at fifteen minutes before daylight. At noon a delicate rose-tint pervades the horizon to the south-east and south-west, where the land affords an horizon, permitting a very peculiar marked pencil line on distant objects. The land in our immediate neighbourhood exhibits just such a clear outline as the moon would produce if rising or passing at a slight elevation round the horizon; but notwithstanding the irregularities on the outline are so very distinct, I was surprised that I was unable to detect our substantial cairns on the several points, so prominent but a week since: they did not exceed three or five miles in distance, and doubtless would have been very apparent through the telescope. Such a distinction, then, in tracing objects, I

consider to be the winter's warning. The weather has become steady and settled, and, guided by the records of previous navigators, I have made up my mind, after investigating the comparative tables furnished by them, that about —40°, as a general temperature for winter, may be expected. I notice that the minimum temperatures for December of 'Hecla,' 1819, —43°; 'Enterprise,' —56·5°; 'Hecla' (third voyage), —35°; 'Resolute,' 1850, —39·5°; and as the general seasons in high latitudes may be said to observe some little uniformity, I have little doubt but we shall not differ, except it be by a few degrees lower in the scale, from our predecessors.

My opinion as to the cold dates I have already stated; but I hope to add to this Work tables exhibiting the comparative ranges of temperature experienced during the several voyages of Captains Parry, James Ross, Austin, and the present, affording ten clear important columns, ranging over thirty-five years.

We find it very difficult to preserve a medium temperature between decks, the cold air rushing down and condensing the vapour so rapidly on the beams as to wet the hammocks at night. Of this the men complain; but if we increase fuel and raise the temperature, it is even worse. The housing is old, weather-worn, and the same which was supplied to Captain Ommanney, with about forty yards to repair damages!

The fitting in these cases should be as perfect as that of the Houses of Parliament: there, it is matter of convenience, luxury, or personal comfort; here, the lives of many valuable men are at stake. A very simple original fitting, or the prepared materials supplied, would have

rendered these vessels comfortable, at least habitable, even with an external temperature of 40° below zero. It is now too late to commence working with iron tools; and in that temperature I should hesitate to ask, much more command, any out-door work; but I do promise to remedy, if my ability permits, great part of these faults next season. My plans are already formed, and have been hinted at weeks since. Looking simply to the temperature, I feel satisfied, so long as we can ensure a moderate dry air, that icy surfaces, ready to absorb all the flying vapours, are not injurious,—are indeed safety-valves; and my opinions are chiefly derived from actual observation, principally on the habits of the Americans, Dutch, Russians, Danes, and Esquimaux. I cannot recall to mind any well-authenticated case of weakness, injured health, or disease amongst them, and yet they all pursue the hot dry air principle, rushing even into extremes.

The great evil here is the grossly unscientific mode of entering our domiciles by our chimneys,—in other words, by our hatchways; all other people civilized, and especially the uncivilized Esquimaux, enter by the lower levels. Experience has taught them that cold descends, and will not run up an inclined plane if any break or resistance is offered. The only mode of obviating this on shipboard is, unless an entering or timber-port be cut in bow or stern, by producing such a labyrinth to the main entrance on deck, that the intervening atmosphere shall be warmed before it reaches the hatchway, and not permitted to act on the decks; further, that all objects interfering with the radiation of heat from the galley fire

be removed; and finally, that the great escape shall be induced by the column of warm ascending air above and surrounding the galley, or kitchen, of our ships.

December 16.—Any change is cheering, but in the present instance the excitement was beyond reason, and therefore sport was very soon spoiled. A she-bear and her two cubs paid a visit to our dust-heap, on which, however, none of Goldner's preserves were deposited; but they thought probably that they might derive some little advantage from licking the tins of Hogarth. Before any concerted action for the capture of our visitors could be formed, some of our sportsmen, too eager to have their first shot at them, scared them off. As this was on the royal preserves, I issued the requisite orders against poaching, determined that, at their next visit, fair play and no favour should be observed, and that an adequate force of dogs and men should attend the hunt. The poaching for foxes also required looking into, and the several agents for the furriers, not in repute in this division of the Squadron, were warned to observe their respective bounds. Hardly had the first excitement attending the visit of these bears ceased, when I learned that they had arrived from the quarter where our dog-leader was exercising his animals with the sleigh, and as they possibly might have done some mischief there, a party was equipped for the search. Warned by the sound of bugle and muskets, he soon made his appearance, and all again was quiet as a ship-of-war can be!

The cold begins to tell on all old wounds, frost-bites, etc., raising unpleasant sensations; and, possibly from nervous affection, rendering a twinge (at any other pe-

riod unnoticed) importunate; nevertheless no one seems to fail in health, indeed the officers and crew will probably be in much better condition on the 25th December, 1852, than they were on that day last year! Their light hearts, no doubt, will be far away.

In the monotony of winter it is well that we can find employment; all our attention is now directed towards the intended spring travelling, and the arrangement of men, as well as aides, to the several sledge duties. As regards myself, upon this latter point, I shall not decide until the last moment, uncertain whether I may not be placed beyond the pale of such exertion. I do not fear it; but I have many croakers about me, who fancy I ought not to venture. With reference to the duty to be executed, I am aware that it will be a very serious and doubtful service, for I know full well the uncertainty of the ice with which we shall have to deal and the difficulties men and officers will have to encounter, should they be compelled to work with boat and sledge together, which, from a curious habit of "seeing ahead," I am inclined to think will be imperative; or, should they succeed in getting safely across to the southern side of this channel on firm ice, still boats will be requisite for their relief, unless indeed the water makes early and permits the ship or tender to visit the southern coast, which I am inclined to think will not be improbable.* As to the north-eastern search, which I have selected as my own route, I have no fears, because, as I shall have to visit islands where the open sea prevailed last year, at an early period, I shall be provided with one or more boats, duly prepared; and, if caught on the mainland, I am

* These remarks were fully verified.

now sufficiently acquainted with the leading southern features to know where to cut through to regain the ships.

The lady bear and her cubs paid another very short visit, but, alarmed by the slamming of a door, made off to the south-west.

On the 21st, our shortest or no day, the seamen of the 'Pioneer' and 'Assistance' performed 'Hamlet' and the 'Scapegrace.' The performance was, as far as we could *hear*, good: but some doubt as to the scenery,—the preponderance of clouds at three feet above the stage, resulting from the condensation of the breath of the audience, rendering the busts of the actors barely visible, and thus, at all events, adding to their confidence, as no blush could be detected.



UNDER THE DISTINGUISHED PATRONAGE OF

CAPTAIN SIR EDWARD BELCHER, C.B.

COMMANDER G. H. RICHARDS, the Manager (*and now Sole Proprietor*) of the Queen's Arctic Theatre, has the satisfaction of acquainting the Nobility and Gentry of North Cornwall and the neighbouring county of Northumberland that he has just arrived from the very POLE itself, accompanied by a CORPS DRAMATIQUE never equalled in this or

any other country. He also brings with him a choice selection of Scenery, only to be procured in that delightful and highly favoured country; and, with a view to the revival of the legitimate Drama, and a desire (he trusts a laudable one) to render, if possible,

THE SHORTEST DAY STILL SHORTER!

has determined to open his house on the Twenty-first of December, for the performance of the first Act of the Tragedy of

HAMLET,

BY THE 'PIONEER' TRAGEDIANS.

HAMLET, OPHELIA	*Mr. W. M'ARTHUR.*
GHOST, LAERTES	*Mr. J. ORGAN.*
KING OF DENMARK	*Mr. G. COUSINS.*
QUEEN	*Mr. FENNING.*
MARCELLUS	*Mr. T. HALL.*
CORNELIUS	*Mr. R. BATCHELOR.*
VOLTIMAND	*Mr. G. HARRIS.*
BERNARDO	*Mr. J. SINNETT.*
HORATIO AND POLONIUS	*Mr. G. EDEY.*

During the Interlude the Audience will be entertained in a variety of ways, including

SONGS BY MESSRS. H. JONES AND C. FIELDER,

and a highly pathetic Story of NEGRO LOVE by Mr. J. REID, in full Negro Costume, as being peculiarly adapted to this climate.

After which will be performed the much-admired Comedy of

THE SCAPEGRACE,

BY THE 'ASSISTANCE' COMPANY.

COLONEL AUBREY	*Mr. J. REID.*
PEROQUET	*Mr. J. BARNES.*
MRS. AUBREY	*Mr. T. BOND.*
CHARLES DARLINGTON	*Mr. A. INGLETON.*
BUSTLE	*Mr. J. MACARTNEY.*
TUCKER	*Mr. H. BRIANT.*

The Manager's Own Band will be in attendance, and he has determined to introduce an entirely new feature into his Theatre on this

occasion. Having, during his recent travels, observed the highly elastic properties of ice, he has, without hesitation, decided to construct his stage entirely of that material, and he trusts that no misconstruction (such as scarcity of deal boards) may arise from an act certainly original) and based on scientific principles.

The Manager and Sole Proprietor also takes this opportunity of offering his acknowledgments to the Public for the very liberal support he has already received at their hands, and ventures at the same time to remind his friends (for such he must always consider the Public) that for the consummation of his fondest hopes, (viz. *the realization of a moderate competency wherewith to retire into private life,*) he still looks to them; and, relying on a discerning people and conscious of his own *deserts*, he will not *desert* the stage while a *plank* of it remains.

The House will open at 6.30, the Performance commencing precisely at 7 o'clock.

Tickets may be had of H. BRIANT, at the Arctic Printing Office, Winter Quarters, Northumberland Sound.

N.B.—The business of the Printing Office is considerably retarded, in consequence of the ink freezing on the rollers.—Printer's Devil.

BY AUTHORITY.] [H. Briant, Printer.

Commander Richards, the indefatigable Proprietor of Her Majesty's Theatre Royal, supported the establishment and his character with his accustomed spirit and effect, and was most rapturously and warmly applauded, particularly at the customary royal message, but this time varied to home-brewed Allsopp. That name will live for ages in the recollection of all Polars.

Sir Edward Parry mentions that the zeal of his manager produced representations even when the thermometer fell below zero. In the present instance the temperature was $-34°$ outside, but the after-deck thermometer is registered as low as $-37°$. It was, however, to my feelings, uncomfortably cold, even in Her Majesty's box.

Great dissatisfaction appeared to prevail at some portion of the speech of the now Proprietor, intimating an

intention of going to Melville Island or the 'North Star,' even to Behring's Strait or the Sandwich Islands, from whence *most liberal offers* had been forwarded. Nothing short of the blackest ingratitude and treachery could induce such a step: the curtain fell in vapour!

Thus we passed the Rubicon of this much talked-of polar winter in Northumberland Sound, the evening terminating at a supper given on board the 'Pioneer,' where "bright eyes" as well as "Brother Polars" were not forgotten.

Scarcely have we breathing time, at this busy season, to dispel the amusing matters yet floating before our eyes, ere some other equally great, or greater, event demands our attention. Surely our good friends in England must be now pitying the poor unfortunate Polars, deprived of the light of that cheering and health-supporting luminary, which glaringly but too often reminds them of some gap in their circle, as well as dwelling on the horrid cold of that inclement, boisterous north, and dreaming of bears, wolves, and starvation!

Wait a few moments: Christmas approaches, and less noise and confusion perhaps prevails,—all are intent on some great object; mighty preparation is going forward, of which the principal, as at home, is kept in profound ignorance: enough that he knows when he sees the bill of fare, and "pays the piper."

December 25.—At midnight certain sounds of music, not customary, were noticed near my cabin door, and permission to enter having been granted, a demi-official note was presented (from the uniform I should imagine from the Court of Louis Napoleon). This was, I eventually found, a Christmas Ode, followed by the same very

well sung; and, with the best wishes of a merry Christmas, the deputation withdrew.

A CHRISTMAS PIECE.

Awake! awake! the Old Year 's going,
Time flies apace;
Awake! awake! the New Year 's coming,
To take the old one's place.

Arise, arise, good shipmates all,
And do not danger fear;
Arise, arise, good shipmates all,
To welcome the New Year.

God bless our brave old Commodore,
And our good Commander too:
Not forgetting all our Officers,
And our true and gallant crew!

Sleep on again, and on your brows
May soft repose be seen!
Sleep on again, while in our lay
We 'll sing, God bless the Queen!

H.M.S. Assistance.

Wishing Sir Edward Belcher, C.B., a happy and prosperous New Year.

Composed, I believe, by the Printer or his Devil.

Shortly after prayers I was officially informed by the Commander of the 'Pioneer' that the State Sledge, driven by the Queen's coachman, in full uniform (beadle of the parish), was in waiting, the Union flying instead of the footmen at the stern. Although such a pageant, perhaps, to those who know me well, was not quite in accordance with my taste, still I had some part in the Play to perform, and knew too well the chords of Jack's humours to fail in their gratification; they were most graciously appreciated. Mounting the state carriage, twelve of Her Majesty's best breed of Polars conveyed me along-

side the 'Pioneer:' every precaution had been adopted to prevent my wetting my feet; temperature, —36°.

Rather pantomimic the change! Stepping on her decks I was metamorphosed, in less time than Harlequin's wand could effect it, into my proper self, received and returned the salutes, inspected the men, and sent them below. Still adhering to my proper character, I inspected their preparations for their Christmas dinners, fancy decorations, etc., all of which were marked by neatness and extreme comfort, the entire midship division of the vessel being, in winter, appropriated to the crew, more capacious and higher in comparison than the 'Assistance.' I had here an opportunity of witnessing the superiority of Arnott's stove over the Sylvester, with less expenditure of fuel.

On the presentation of wine by the leading petty officer, I addressed a few words to them, expressive of my satisfaction, and reminding them that the roast beef then smoking before them was "Her Majesty's own," requested that due honour should be accorded to the health of "Her Most Gracious Majesty Victoria, God bless her! and all the Royal Family." This over, I gave the health of "The 'Pioneers,' and may their enjoyment never be less than this Christmas!"

I now returned, to preside, at noon, over the opening festival of my own crew. Here too I found all the luxuries, not forgetting roast beef and plum-puddings. The arrangements were all perfect, and in good taste, and our trusty crew were prepared to do justice to their fare, and enjoy themselves. I felt differently here: why, I know not. I felt it a more solemn act. These were my own immediate crew, and I felt a deep interest in

them all. They were yet *without fault*. I could not help telling them so, and expressing my earnest hope that they would return as we came out (a maiden ship?). Accepting the proffered glass, still of the Queen's own good port, I gave them the similar toast of "Our Queen, God bless her!" Never did a more hearty peal, nor from heartier lungs and more loyal hearts, ever try to burst those decks. My next duty to my Sovereign being that to my own family, I gave them "A merry Christmas, and may God bless you all!" Taking advantage of the fog, I retreated to my cabin, possibly not missed, but the cheers probably continued until they discovered that they were alone in their glory. It has never been my lot before to witness more apparent enjoyment than seemed to pervade the Northern Division: nothing followed to shake that good opinion.

About six the officers of both vessels, numbering seventeen, dined with me, and I think, by the very kind forethought of several warm-hearted fair friends, who will possibly remember their good deeds with satisfaction, that my table groaned under as goodly a spread of the luxuries usually exhibited at this season as it could have done in Merry England, not omitting the roast beef, plum-pudding, mince-pies, and frosted cake of our national predilections. "Poor Polars, how I pitied them!" Yet they seemed to enjoy themselves, and even to think of those poor people in England who might not enjoy themselves with half the genuine feeling. Our Queen and Consort, our Duke of Cornwall, our relations and friends there, were not forgotten, not even the banner cherubs and their mottoes; nor were our companions here, though for a time severed, yet possibly to be for a

moment reunited in our spring travels, omitted. The toast, "The rendezvous, 77° N., 105° W.," was emphatically given and determined on, as if it was already engraven on the chart. About 1.30 each retired, to dream of home.

Many uninterested persons may doubtless be of opinion that these are not matters for the public journal of the Commander of such an expedition. I am willing to risk the verdict; it is the true index of the habits and customs of the Arctic explorers in 1852–3–4–5–6, etc. Many an anxious eye may be turned to these particular pages, when others of dry matter, or of a controversial complexion, would studiously be avoided. We have but little sun at this season. Let us enjoy all the brightness that warm hearts and innocent amusements can afford, not forgetting those whose feelings are also gratified at learning that in all our enjoyments their presence alone was wanting to complete the cup. Sailors ever had, and will, so long as the good old breed is not extinct, have their feelings deep as the element they swim on, and no disguise.

December 26.—All quiet; great disposition to sleep, in which they were allowed to indulge until the time for prayers, put off today until eleven. To many a Commander this is the most anxious day. Thankful did I feel that all had gone well,—not a whisper of any defect. "What would I not give to wander?"—however, I feel assured that we were not forgotten; so my dreams, at least, assured. Where will our next winter be passed? was more than once started,—a most difficult problem to contemplate: time alone can tell!

December 28.—Spring tide of this moon, and yet we have the thermometer down only to −40·7°; mercury partially, not entirely, frozen. How one's feelings appear to accommodate themselves to the changes! It is calm, and therefore we feel it less. I have just returned from taking exercise on the floe, but without being sensible of any inconvenience; and it often occurs to me that it is injudicious to make so much parade about temperatures, when, were it not for the thermometers, few would feel the variation. On the other hand, the knowledge gives a man assurance of what he can bear, and furnishes him with a Mentor which prevents his exposure to undue cold without being prepared to meet it. It is curious, to the uninitiated, to view the Esquimaux dogs perfectly satisfied and luxuriating in the snow at this temperature! They have snow-houses, into which they can retire, if cold pinches; but we do not perceive that they do so until the breeze makes it felt, and then the temperature rises with the force of the breeze. When the wind blows strong, with drift, the poor animals howl and move about evidently uncomfortable; hunger and frozen food may in part account for this, but why are they never frost-bitten?

One very curious fact, which I have repeatedly noticed, and to which I never have observed any previous allusion, is the falling of light bodies during intense cold, and, of course, calm weather. Does intense cold produce anything to be compared, directly or indirectly, to a vacuum? Vapour condenses and falls perpendicularly as fine crystalline ice; all objects exposed to this vertical action become covered with rime, but never laterally. The

very curious question results,—from whence does our snow, or *crystalline stars of ice*, come? They must be formed and precipitated from an atmosphere exceeding 32° in temperature: they descend into —42°; no less than 74° variation in temperature. Does the cold medium then compel all warmer bodies (possibly by condensing their vapour on them) to fall as the feather under the receiver of an air-pump? Verily we hourly witness strange things, and but too often how many pass disregarded, unnoticed, because others have preceded! Such will ever be the case where science is at a discount, or the possibly ignorant self-constituted philosopher sneers at the questions which he is unable to answer, or which happen to interfere with a favoured or popular theory.

The New Year of 1853.

January 1.—This morning was ushered in by a song, composed by our own bard, and sung by the choral band of 'Assistance:' a copy was delivered to me, but being in bed, much tired, and suffering from a fall on the ice, I could not enjoy its intent. The crew however are enjoying themselves; so far all right.

Today our gun-room officers entertained their friends. It passed off much in the same style as Christmas, Commander Richards presiding. I was of course a guest, and happy to contribute to the general good humour. We only wanted the missing parts of our Squadron, to make all complete. Shall we be able to pass it together next year? My own impression is adverse: if we should meet before, undoubtedly our winter stations must be asunder.

January 6.—Our temperatures seem now inclined to reach their lowest point. It is at present —51·5°, and falling; yet we do not feel the change. In some of the journals we may possibly find a minimum temperature nearly 2° below the standard, but the final results recorded in the Meteorological Journal will alone be correct. The annexed comparison of the seven best will indicate pretty clearly the value of the instruments:—

Standard.	2	6	8	20	3	4	5
— 20°	21·0°	20·0°	20·6°	21·2°	20·4°	20·7°	21·1°
— 30	31·0	30·0	30·0	31·5	30·8	31·2	31·5
— 40	40·5	39·6	39·8	40·5	40·5	39·5	41·3
— 50	50·0	49·0	49·0	51·5	49·0	49·3	51·9

Cold as this is,—and my cabin temperature fell to 22°, freezing everything in it (*malgré* Sylvester),—the cold, as intensity, would not have been noted, unless the officers at the Observatory had given information.

Last night heavy sounds were heard, and some asserted that the reports of guns were distinguished; but I suspect that it was merely the result of a distant floe-crack, as the temperature of the ship causing her to release herself from the ice, or from portions hanging on her, frequently produces similar results. The light is visibly increasing, enabling me, near noon, to note time easily by a watch.

January 7.—The noises were repeated last night, and a large additional crack between the ship and the Observatory was noticed. I understand that the 'Pioneer'

also shifted her bed. The great masses of snow on the ice, hourly consolidating from evaporation from beneath, probably press the floe downwards, and produce these very sharp sounds, very similar to the snapping of heavy bolts of iron. The prevailing impression, I believe, is that it arises from the latter cause. However, this is not satisfactory: no bolt or channel plate, exposed, has been known to part; and if all these sounds proceeded from such causes, I fear there would be none left to trust to, next summer.

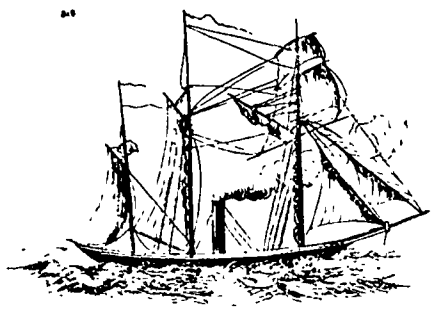
The mercurial thermometers having indicated temperatures much below the freezing-point of mercury, and this affording an opportunity of examining this metal but seldom presented to quiet and careful research, I determined to avail myself of it. 240 grains were weighed in my cabin, contained in a fine porcelain mortar; the mortar and mercury having been previously subjected to a continued heat on my stove, to expel any possible moisture. The mercury was pure, being part of that which escaped from the standard barometer on my cabin sofa, and carefully preserved in a stoppered phial for such experiments. (Temperature 40°.) It was then carefully removed to the thermometer-house, and the balance found correct. Exposed for twenty minutes to a temperature of $-47{\cdot}7°$ the mercury began to crystallize: the circumference became very convex at its edges of contact with the conical vessel in which it was contained, and the centre raised to a point when it had actually congealed; it lost 1·5 grains. At the first fifteen minutes' exposure, the scale in which the mercury was contained rose very perceptibly as it diminished in

weight; it then recovered itself; and finally, on being re-weighed in my cabin, was deficient 1·75 grains.

In order to determine its effect on water, I turned the frozen mass into a tumbler of water containing six fluid ounces at 47·5°: the mercury simply became encased in ice, and when it at length flowed on the bottom, the temperature indicated 44·5°, a difference only of 3°. I was anxious to determine the form of its crystal: this was a very difficult matter. It was attended with great inconvenience in the open air, and the change was screened by the superficial crust forming before the body became solidified. The transition from the solid to fluid could be better watched: this I tried. It then occurred to me that by using a large open-mouthed jar, containing half a gallon of spirit of wine or alcohol cooled down to −47·5°, that I could leisurely, in my cabin (aided only by candle-light), watch its motions, and freeze or liquefy at pleasure. In this I succeeded,—remarking however that several travelling mercurial and other thermometers presumed to read below 42°! But to the result of my examination: previous to freezing, or at the instant of returning to fluidity, I noticed that the mercury assumed a very active motion, resembling living *polypi*,—parts moving in circles with great velocity. Positive crystallization I could not detect, but the inclination appeared to be nearer to the forms of lead or bismuth on cooling, the surface lines being clearly rectangular, or a beautiful network. This was on the semifluid; in its dense form nothing could be traced. Although much exposed today to low temperature, no change in my ordinary cabin dress was found requisite,

although occasionally I inquired if my nose exhibited any symptoms of the whiteness attending frost-bite. The dogs were more than usually playful, and fond of being caressed; once I thought that they would have been glad of my seal-skin mits by way of luncheon. However generous one might be at another time, the present temperature rendered it inconvenient.

January 6.—This evening the 'Pioneer's' party furnished their quota of amusement, as may be learned from the following programme:—



H.M.S.V. PIONEER,

NORTHUMBERLAND SOUND, POLAR REGIONS.

LIEUT. SHERARD OSBORN has the honour to announce to the Polar Public in particular, and the World at large, that

THE QUEEN'S ARCTIC PHILHARMONIC SOCIETY

will hold its General Annual Meeting on Thursday evening, the 6th of January, under the immediate patronage of

CAPTAIN SIR EDWARD BELCHER, C.B.

AND THE OFFICERS AND SHIP'S COMPANY OF

H.M.S. ASSISTANCE.

When the distinguished members of that Society, as well as other local Musical Celebrities, will take prominent parts.

The Evening's Entertainment will commence with the full Band playing, under the leadership of our

Polar Costa—HERR HARWOOD,

A GRAND FANTASIA, altered from Count Hum's Les Adieux à Bœuf et Bière.

PART I.

Sentimental Section, led by the Primo Tenore, SIGNOR ALLARD (Perp. Grand.) will execute various select Solos; and Duets by Mr. W. WOOD, S.C., SIGNORI SINNETT and CUSTANCE, all Members of the Q.A.P.S. Followed by

UN PAS MELÉ—by MONSIEUR C. ALLEN.

The Comic Section, under the able bâton of Professore DON JUAN RICARDO, will consist of an elegant selection of Melodies by DONS JOHN and RICHARD HALES, DON BENJAMIN YOUNG, and DON GEORGE COUSINS, a galaxy of Buffo Singers unequalled in these Regions.

PART II.

La Valse des Baleines and Narwhal Polka! by the Band. Followed by a Grand Terpsichorean Interlude, by Messrs. DICKENS, BATCHELOR, and ALLEN.

The Serio-Comic Section, led by that well-known Basso HERR HORATIO WEBB, and exhibiting such names as

HERR ORGAN, HERR EDEY, AND HERR DICKENS!

will assuredly fulfil the most sanguine expectation of lovers of the Anglo-Saxon School.

The Curtain will drop to the Glorious Strains of

GOD SAVE  THE QUEEN!

The Proprietor need hardly remind the Public, that having secured them a Musical Feast, in which the whole Talent of the North will be concentrated, that Her Majesty's Theatre and the Italian Opera are entirely done up, and *the Sole Lessee and Manager* is supposed to have absconded with his Scenery and Elastic Stage! to Beechey Island, to divert the Depôt.

The general arrangements of Seats, Lights, and Refreshments, have been placed under the catership of Mr. Jos. Organ, and Mrs. Fenning has engaged to supply Ices gratis.

BY AUTHORITY.] [H. Briant, Printer.

This amusement, remarkably well got up, consisted of a selection of very good songs; and what rendered them to many the more interesting, particularly to the officer part of the audience, was their almost perfect originality.

The lower deck of the 'Pioneer,' warmed by Arnott's stove, dry, and much more comfortable than my cabin, accommodated both crews, mustering about eighty-six. The entertainment closed with the National Anthem. The temperature has not risen above $-46°$ the last four days, exhibiting a mean temperature for the interval of $-53{\cdot}20°$, or $-55{\cdot}61°$ for three days.

January 15.—The following may prove interesting to inquirers after the extreme cold of our position.

I observe, in that excellent work of Sir Henry De la Beche (on Geology), that M. Arago asserts, "that in no part of the earth, and in no season, will a thermometer raised two or three metres above the ground, and protected from all reverberation, attain the 46th Centigrade degree." Secondly, "In the open air, the temperature of the air, whatever be the place or season, never attains the 31st Centigrade degree." Thirdly, "The greatest degree of cold which has been observed upon our globe with the thermometer suspended in air, is 50 Centigrade degrees below zero." Fourthly, "The temperature of the water of the sea, in no latitude and in no season, rises above 30 Centigrade degrees." We have been informed that Sir James Ross registered the air at $-60°$; of this however I have not at present any direct evidence. As to any question arising to affect the registry of our instruments, there can be no possible

doubt. The observers have been too numerous to allow of mistake: the self-acting index tells its own tale, adverse observers watch every decimal division, and the lowest minimum thermometer, after severe investigation, has been rejected. I copy the following from the Meteorological Journal:—"*January* 12.—About nine this evening, being at dinner with my weekly party of officers, I was informed that the temperature had fallen below −62°. As this was a question not to be casually passed over, I visited the Observatory, and remained walking about in my simple cabin dress for some time; −62·5° was the lowest which I, as well as others, read at the standard. But the minimum thermometer indices, read next day at eight A.M., only gave −62·0°, −61·6°, −66·0°, −63·2°. The night was bright and calm: no sensation of cold. −63·2° is the external exposed thermometer, but was never *read*, excepting by its *index*, at that graduation. This external thermometer, after severe testing under the boat as low as −40°, with the entire range of spirit and mercury thermometers, was selected as the standard Observatory gauge: supported on an open frame, attached to two pikes about one foot asunder, it was subjected, uncovered, to all the winds of heaven. That was *read* at −62·5°, and indicated what I have rejected, −63·2°.

January 15.—I was induced, whilst writing these remarks, to turn to Parry's work, page 145 (first voyage, 1819–20). On the 15th of February he remarks as his coldest, the thermometer standing at −54° for fifteen hours and a half, but his maximum on that day was up to −32°. Looking over the Observatory record, I no-

tice that the following indications of low continuous temperatures prevail:—

—46° and below,	156	continuous	hours.
—50 „	89	„	„
—52 „	88	„	„
—55 „	52	„	„
—58 to 62·5°	14	„	„

As the tabular register may never meet the eye of the casual reader, I will here insert eleven cold days in January, from the 5th to 15th inclusive:—

	Maximum.	Minimum.	Mean, 24 readings.
January 5	42·5°	48·0°	45·08°
„ 6	47·0	51·5	49·02
„ 7	37·0	49·3	38·01
„ 8	39·0	47·5	43·00
„ 9	46·5	50·0	47·97
„ 10	49·5	56·0	54·17
„ 11	50·5	57·0	54·31
„ 12	53·5	59·5	56·25
„ 13	45·0	62·5	54·23
„ 14	46·0	50·0	48·00
„ 15	42·0	52·0	47·65
Mean Temperature for 264 hours, 48·88°.			

If this will not satisfy the appetite of the cold-loving hero, I will gladly invalid in his favour.

Let us now review our proceedings of late. We have all been absolute boys,—some old ones nevertheless.

We leave (I am as bad as the rest) our warm cabins, at say 50°, rush on deck and on to the floe, after science or Bruin, it matters not, at—take the mean, —49°; 49 + 32 = 81° below freezing, and 50 + 49 = 99° change of temperature, without damage!

We have throughout been thinking, or rather talking, of ourselves—we do happen to think more deeply of the crew; but thanks to the unremitting attention of our medical men, and to the general care taken to prevent exposure, I should be disposed to assert, in my proper capacity of the Commander, that no official report of frost-bite has yet reached my ears. To descend perhaps, and allow that once one of my men "took his Captain *by the nose*," under pretence that he thought his Captain's nose was frost-bitten, and his warm (?) hand could restore it, "is not quite true." But I totally and indignantly repel the very low insinuation, and believe that the blood from his heart flowed so rapidly to the end of his arm, that it saved my nose by the application of the *back* of his warm hand, and I thank him: even if it was a deceit, I forgive him. We command here; no bed of roses nevertheless—no absolute command is! Ask the fathers of families, and this is not a small one!

To continue the matter of low temperatures. They made no impression here; the pains of forehead or lungs some might have experienced, but they were never mentioned in my presence. The only projection about which I felt interest was my nose, and upon this point (not a very prominent feature) I felt a sort of monomania, something like, going into action, that I must be wounded in a leg, and nowhere else. I never intended to be killed,

and so I told my surgeon when that idea was realized, but I am constantly asking people to view my nose. But as I have so far wandered into self, and I know that certain professional men who interest themselves about me will expect to know, I will merely say that I expected certain wounds, cuts, frost-bites of youth, etc., to trouble me. I have suffered intensely, more than can be explained, but nothing to disqualify me, in any manner, for this important command, or the liabilities attached thereto. My feelings are my own; so long as I perform all my duties, who cares for them?

Our present temperatures are low enough to satisfy most men, but if, in truth, −90° can be *truly* found in this region, I would almost stop to see it.

Mercury.—The freezing-point at which pure mercury (not impure amalgams of spurious mercury at low prices, but volatilized, distilled, adapted for thermometers, etc.) should congeal still continues to haunt me. Unfortunately, I left behind me every work on this subject to which I could, as to late date, refer. That −39·5° is *not* the correct point of congelation our standard mercurial thermometers prove, nor do they always contract to the same division. The congelation of mercury does not appear to form any part of the acknowledged divisions on these thermometric (?) instruments: the mercury thermometers supplied to this Expedition from Greenwich, as well as Kew, were graduated below −40°. I had myself remarked that no notice was taken of them in the record, under the assumption probably that they could not, dare not, act contrary to *print*, but I ventured to differ, why I will state.

On the 17th December I had noted that the mercury thermometers did not cease to act at −40·3°, −40·0°, −40·0°: this excited my attention; weekly I transcribe the register. On the 28th I noticed that the *registry* of all the mercurial thermometers ceased at the *same indication*,—on the 4th January at 42·3°, by standard. Unfortunately I did not notice it earlier, but on the 23rd of January, on my copying the rough register, I inserted the following order:—"The mark *f* to be prefixed to D when the mercury is congealed; *p f*, when partially congealed. The numbers 19, 35, 34, 2, read to −40° and below. The divisions below must be estimated, *i. e.* the point where it congeals, or declines moving further." He (Mercury) had stopped most religiously at −39·3°, −39·2°, −39·0°, −39·0°; but in this case he was under martial law, and he knew he must move. I suppose he made his mind up to it, for I find the following curious register, taking care to satisfy myself frequently by personal inspection.

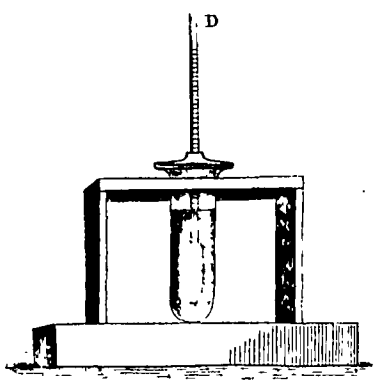
Noon.	Standard Spirit.	19	35	34	2
January 26	43·0°	42·0°	42·0°		41·2°
„ „	46·2	Est^{d} 46·0	50·0*		
„ „	45·4	46·0	49·0*	BROKEN.	
„ 31	45·7	45·0			
February 3	42·9	42·0	42·0		41·0
„ 10	41·7	41·5	41·5		40·6
„ 21	44·5	42·5	42·5		42·0

* How came this change?

Noon.	Standard Spirit.	19	35	34	2
February 21	43·8°	43·0°	43·0°		43·4°*
„ 22	45·1	44·0	44·0		43·2*
„ „	42·2	41·3	41·2		41·2*
„ „	41·6	40·6	40·6	BROKEN.	40·0*
„ 26	42·1	41·0	41·2		41·0*
„ „	42·3	41·2	41·2		41·0*
„ „	42·0	41·0	41·2		40·6*
March 3	43·3	42·2	42·2		41·8
„ 8	44·2	41·2	41·3		41·1

After all this, I ask, who will dispute the power of a Captain of one of Her Majesty's ships-of-war? Noon he has invariably controlled,—eight A.M. and eight P.M. also; but here the thermometers are compelled to condemn themselves or the mercury.

With these matters fresh on my mind, I constructed the mercurio-alcoholic thermometer D, being a glass-stem



* If mercury freezes at −39°, how is it that it continues to rise and fall, in conformity with the spirit, between −39° and −46°?

spirit-thermometer with graduated stem inserted into a test-tube containing four ounces of pure mercury, well corked and covered with four layers of bladder, to protect it from the air; it was self-balanced in a kind of test-rack, and admitted of a pendulum motion to determine its freezing-point.

It happened however, unfortunately, that this thermometer never did its duty satisfactorily, and all its records are in such a state of confusion that they have been rejected. We may not, it is true, be confined to this high latitude, but it is probable that we may have an opportunity of pursuing this investigation more rigidly at stated temperatures next season.

Next to mercury, it occurred to me to partially freeze Allsopp's ale, and reserve the unfrozen fluid for future examination: congelation took place at 22·5°. That frozen and drained from one-third of the fluid, when again reduced to a fluid state, was very insipid; the remainder concentrated.* This mode of concentrating cider is practised in America, three barrels making one of good quality.

January 24.—Already we begin to feel the increase of daylight, four hours (between ten and two) being now available. The light red tint of the southern horizon also intimates that the prodigal (sun) may shortly be expected to exhibit his cheering and animating rays: we shall probably exhibit a sort of chameleon tinge, inclining to dead tea-green or an incipient case of jaundice!

The late extreme cold induced me to make experiments

* This concentrated has been tried since my arrival in England, and found to be excellent—quite a liqueur.

upon the expansion of alcohol under low temperatures. The instrument for this purpose was furnished by Mr. Glaisher, of the Royal Observatory, as well as a supply of the same spirit from which his thermometers had been filled. Unfortunately those who operate in England seldom dream of the mean temperature under which such observations would be conducted here, and have failed not only to supply gloves adapted to $-50°$ or $-60°$, but also to warn those who may not have brought their brains with them, that 10° to 20° below the congealing point of mercury is hot work. The raw experimenter might easily lose his hands or life, should he inadvertently take up the bottle containing half a gallon of alcohol at $-58°$ or $-60°$, without the hands being properly protected.

We find that the unfortunate artilleryman, servant of Colonel Sabine during the voyage of Sir Edward Parry in 1819, in consequence of endeavouring to rescue the dipping-needle from the flaming Observatory, was compelled to undergo amputation of part of four fingers on one hand and three on the other; and it is but natural to suppose, from all the causes then in action, that the instrument itself could not have cooled down below $-43°$, the prevailing temperature away from the fire: what then would be the effect of a person tumbling and breaking a bottle of alcohol, and shedding it over his hands and person at the temperature of $-58°$? Even with double gloves, lined with fur, I felt the cold sharply, and my hands generally suffered, but more particularly the nails and points of forefingers and thumbs, throughout the winter, rendering adhesive straps neces-

sary to close the cracked skin; resulting solely, I believe, from constantly handling metal instruments and tools at very low temperatures. The affection was so severe, that I termed it the finger fever; all the nails being more or less affected, and, as they advanced, exhibiting corrugated transverse ridges, with spots occasionally; however, I eventually found that these experiments could be satisfactorily conducted in the Observatory, after cooling the materials outside, by consenting to the loss of a few degrees.

Better however that I should suffer, than, by any neglect of mine, some other unfortunate of lower rank should be crippled, and obtain but very inadequate remuneration,—although loss of fingers to me would be very little short of loss of life. I think my spirited and talented friend, Mr. Glaisher, might have whispered, "But, my good Sir, when alcohol is reduced to 94° below the freezing-point of water, pray take care of your fingers." True it is that, internally, alcohol is a heating spirit, but we have no name for it under these burning circumstances.

CHAPTER IX.

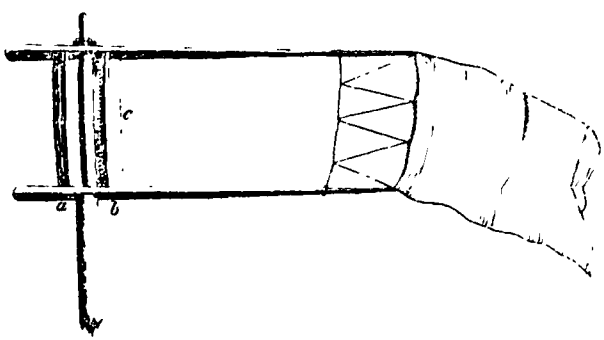
Rise of Temperature.—A Bear shot.—Termination of Darkness.—Reappearance of the Sun.—Death of a Marine.—Cold Period of March.—Table of Temperatures.—A She-Bear and her Cubs.—Sledges inspected.—Feet Wrappers.—Departure of the Sledges.—Beacons.—Cairns.—Parhelia.—Inland Excursion.—Wavy Ice.—Cooking Apparatus.—Lamps.—Return of Depôt Division.

On the 26th of January we experienced the wind strong from the southward, with heavy snow-drift; the temperature rising with the wind and spring-tide from —42° to —31°. From habit we now consider —40° as our scale, —30° being talked of as the comfortable, or not unbearable, travelling temperature: I dissent from any such absurdity. If we should remain many years longer in these regions, I really begin to fancy, provided we could bring our inclinations to agree with Esquimaux food and condition, etc., that we could endure any cold under the moon, for we are now perfectly satisfied that nothing here, under the sun, would be unpleasant. Latterly I have extended my walks to the summit of Mount Beaufort, with a temperature of —44°; but, although the simple exertion of ascent proved unpleasant to the lungs, no sensation of cold equal to that produced by a low

temperature of —20°, with light breeze in the face, was experienced.

January 28.—Early this morning, about two A.M., the dogs gave notice that a stranger was in the grounds, and, by their yelping, probably within a few yards of the Observatory. Lieutenant May and Mr. Pym followed up the "cry," and, led forward by the dogs, came up with a bear, which was brought to bay by the dogs on an elevated ice hummock. Poor Bruin was evidently puzzled, doubtless calculating on being beset by so many wolves; but his fate was soon settled by a rifle ball, when the dogs rushed in, and would, if not kept down, have made a warm meal. Three of the pups, evidently quite unaccustomed to be in such presence, were very daring, but fortunately escaped unscathed. Even at this early hour volunteers were found to flay and bring in the skin;—no accounting for taste!

About this period I constructed a vane, to determine the effect of the direct force of the wind on a thermo-



meter exposed to its full influence, *a*, compared with its opposite, sheltered, *b*. The results were too trifling to

afford any reliable result. The dotted line *c* represents the covering board on the lee side.

This will close the month of January: not much unlike a gloomy English November, but not at all realizing the very cheerless long winter nights which have been so frequently dinned into our ears, that I was almost induced to think of sleeping them away on "eider-down beds;" but, no less strange than true, these were recommended as absolutely indispensable!

February commences our first spring month, and we begin truly to feel that the days perceptibly lengthen. All are looking anxiously forward to the 18th, for the reappearance of our cheering luminary, which will find our travellers in high spirits and with some impatience to try their powers on the floe.

About the 14th and 15th the weather underwent unexpected changes, the temperature rising as high as 2·5° above zero. The magnetometer also has of late exhibited such sudden and incomprehensible disturbances, that I determined on the construction of an independent direct instrument, on the plan of the old portable Declinometer, but in the present case substituting a heavy nine-inch magnet for the magnetic telescope, and introducing, in Y's beneath it, a brass telescope (adapted from my sextant), with the scale engraved on mica and placed in contact with the object-glass. A house was also constructed of snow bricks, affording a distance of twenty-five feet between the two instruments, and a huge block of ice introduced for the pedestal.*

On the 18th our younger men ascended Britannia

* This instrument came into action on the 21st of March.

Mount, about fifteen hundred feet above the sea-level, in order to observe the sun at noon. On Mount Beaufort, about two hundred feet above the floe, they were preparing the base of a very large cairn, or tower, to mark our visit and place of wintering. A cheer from this party afforded me the agreeable tidings that he was seen from thence; and had it been the Houses of Parliament in flames, we could not have hastened up the Mount with greater anxiety. There he was at last! Many and very dry questions were put by some of our humorous tars. He appeared very much distorted, like an oblong grid-iron, and but just showed his golden but intensely bright rays over the outline of the distant southern hills.

The preparations for ice travel are now assuming a more active and decided character. The order to be ready for service on the 15th of March has gone forth, the crews are all told off, and the respective sledge banners assigned, to be formally delivered at the general review. My own peculiar ideas of the weather about the 10th of March will prevent any decided motion before that period. Many now are the discussions which take place as to the possible routes which Sir J. Franklin may have taken; but I firmly believe, from what most of us have witnessed, that, if he entered this Polar Sea "to follow the pack," no ship ever constructed could withstand its customary pressure. If he entered the Great Arctic Ocean, or Polar Basin, there he might be drifted for ever; for it never can, in my mind, be at rest. These reflections however belong rather to the end of our cruise. If he passed through Jones's or Smith's Sounds, it is possible we may have the happiness of meeting some of his

party among the Esquimaux, for I never can divest myself of the impression that their parties still continue to visit those lands.

February 27.—On this morning, the anniversary of my own birth, died suddenly, but not unexpectedly, William Cutbush, Marine. From the period of quitting England he had been suffering from pulmonary disease, and I cannot but express my surprise that such a man should have been selected or allowed to embark on such a service. In England he might have lived years: here his death was inevitable. To the public authorities I leave the case, as that also of our Marines generally. He was interred on the summit of Mount Beaufort, and over his remains that huge stone pyramid will be erected: a stone, to which a leaden plate is secured, bears the following, struck with metal punches:—

SACRED TO THE MEMORY OF
WILLIAM CUTBUSH,
Private, Royal Marines, of H.M.S. Assistance,
Native of Northiam, Sussex,
Who died on board on the 27th February, 1853,
after a protracted illness, from disease of the lungs,
AGED 34 YEARS AND 4 MONTHS.

He served with credit in the Royal Marine Corps for a period of 16 years 4 months, earning two badges and the Syrian Medal; twelve months in H.M.S. Assistance, respected by Captain, Officers, and Crew, and beloved by all who knew him; and died deeply lamented by his shipmates.

"HAPPY ARE THEY WHO DIE IN THE LORD."

I was unfortunately (possibly from taking severe cold in examining the excavating of the grave) incapacitated from performing the last ceremony,—the first time in my

life. Commander Richards, attended by the officers and crews of both vessels, officiated.

February 28.—Time flies! here is the last day of February: daylight at eight, temperature still hanging between —37° and —47°, and our "third portion" of the winter fast approaching.

March 6.—The temperature for the last two days has maintained a mean of —52·83° and —52·29°; maximum —47·5°, minimum —57·3°; enough to satisfy the greatest epicure that there is a cold season between February 27 and March 10! Possibly I should be one of the foremost to ridicule any man who asserted that any *laws* guide these matters; but rain is expected at St. Swithin's, summer commences in Canada and Nova Scotia almost to a day, and if any one will take the trouble to consult meteorological journals of cold climates, he will be able to *fear cold*, at all events, at particular dates: many chances at dice are calculated to much greater mischief and with almost unerring precision. But I shall not be satisfied until the 10th, or even the 15th, is past: no travellers will move before the latter date, and my movements depend very much on the matter. My chief object is to push across the depôts to the south side, between the 10th and 25th, for I have my misgivings if the final change, adapted to long journeys, will take place until the 25th. The orders however still stand for the 15th of March, and on that day the crews will be mustered.

March 13.—On the next page will be found a table of temperatures, embracing the last ten days, with the preceding maximum temperature.

1853.	Maximum.	Minimum.	Mean.	
March 3	−16·0°	−35·5°	−22·60°	
„ 4	37·0	49·0	46·27	Mean of 10 days, −43·231°.
„ 5	47·5	57·3	52·83	
„ 6	49·5	54·5	52·29	
„ 7	48·0	58·5	51·96	
„ 8	38·5	46·0	41·54	
„ 9	31·5	40·5	36·83	
„ 10	29·5	40·0	35·08	
„ 11	34·0	45·0	39·94	
„ 12	34·5	40·5	38·13	
„ 13	31·0	40·0	37·64	
„ 14	14·0	33·0	26·50	

On the 14th of March the Surgeon inspected the crews, and reported—sound.

The outlines of the land are now becoming very distinct, and I have strong impressions that some of our neighbouring inlets may afford a nearer course to the Northern Sea; but this I cannot venture to look into until I have pushed this depôt across to Cape Lady Franklin. All our sledge crews are now eager for the work; and if any vestige remains, northerly or southerly, our parties this season will, I feel quite satisfied, settle the question most satisfactorily.

The morning of the 16th of March discovered the same old lady and her impudent cubs again on their way hither. This time it was determined that order and method should prevail, affording general amusement. All hands were summoned, and the sportsmen

par excellence were to be seen carefully loading their guns. No one was permitted to slam a door, or quit the ship; the utmost caution was observed. Our leading sportsmen were passed to the 'Pioneer,' one division in readiness to push to the south-west, another party to the south-east, the seven dogs and sportsmen about south. I did not join the hunt. However, some men there are who will spoil sport: who he was I know not, but before the enemy was within shot, he fired. The dogs however, on this occasion, did the business. Keeping the old lady in constant alarm and worry for her cubs, which the dogs dashed at, the sportsmen soon got within sensible firing distance; she fought nobly for her cubs, but it was useless to contend with musket-balls. All three were killed!—not however before the mother had given our principal, but worthless dog, a scratch which sent him away yelping, sickening him of such work for the future: a Dane, not an Esquimaux: he afterwards committed thefts and other improprieties, and ended his troublesome life by an act of suicide, with a spring-gun set for a wolf.

On the 17th of March a most decided change took place in the weather, the temperature rising, at noon, to +5·5°, on the 18th to +21·5°, and on the 19th to +14·6°. I consider the 17th, therefore, as the break of the season.

We now cleared away the hole for the tide-gauge under the stern, cutting through seven feet of ice. Owing to the daily increasing weight of the surrounding snow, the ice began to give under the pressure, and around the ship in particular the snow became uncomfortably wet. Taking the height of snow above the solid ice at fifteen

feet, and the mean thickness of ice at six feet, we should obtain twenty-one feet as the apparent thickness of the floe within twenty yards of our sides. All the ice between us and the 'Pioneer' is much thicker, and that between us and the shore grounds, where we had our tide-pole in sixteen feet! The *bonâ fide* off-shore floe of a season does not, I believe, exceed six feet in thickness, and should you come into collision with it, will find any increase quite immaterial: it does its work as surely as an iceberg of six hundred feet.

To return to our tide-pole: no sooner had this hole been completed, than the water rushed up similar to an Artesian spring, covering our promenades with about ten inches' depth of water, and causing some fears for the sinking of the snow wreath before alluded to, now representing, very prettily, a heavy white roller about to overwhelm the ship.

At times I did not feel quite satisfied that mischief might not occur. Our fire-hole, abreast of the ship, had been kept open all winter, and no such overflow as this had occurred. Taking also into consideration that the enormous weight firmly attached to both sides might, by some sudden movement, be released on either; the strain which any such sudden action must produce would materially injure the ship. We had no remedy but to "let well alone,"—and all would probably in due time work its own course, irrespective of any feeble efforts that we could make; independent of which, it was not a time to weary our crew with any unnecessary exertion. With the low temperature which must yet prevail for some time, and probably below zero, this must

soon freeze into a still more solid mass. I began now to repent having altered my determination, of weeks past, to start the depôt on the 16th: but we live in glass houses. If any accident resulted, and the party had started before the 21st, blame would have been heaped on me. "Success is wisdom;" but to keep up success, leave no hole in your jacket unmended. I was persuaded easily (for this reason) to await the 22nd.

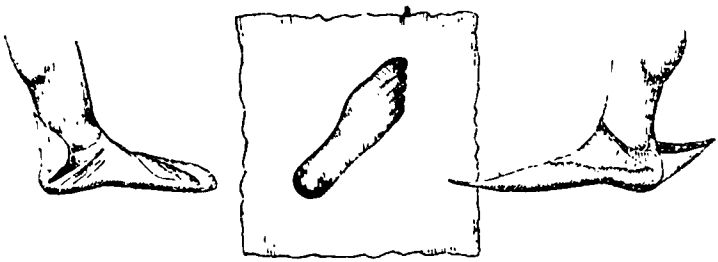
On the 17th of March it was calm, with the thermometer at +1°. I inspected eight sledges,—officers and crews,—in travelling order, and complete as in tables in Appendix. The first division, now about to start, under Commander Richards, numbered six sledges.

Commander Richards	8 men.
Lieutenant Osborn	8
Lieutenant May	11
Mr. Pym, Mate.....	11
Mr. Allard, Master (additional).....	11
Mr. Ricard, Assistant-Surgeon (additional)	8

57 Men. 1770 Rations.

On the 19th, blanket wrappers, travelling-boots, mits, etc., were completed. I am not aware that these subjects have been discussed, but they are matters which to the landsman require explanation; and where success attends any particular mode of dress, any habit of travel, etc., it becomes of importance to the general interests of this service that it should be recorded, for good or evil, to be followed or avoided. Hitherto all our attention has been most intensely directed to the foot equipment. I have throughout disliked the carpet boots: for travelling they are useless. The last Expedition, I believe,

established the canvas boots,—the Hudson Bay custom, the blanket wrapper. This latter is formed of a piece of good thick blanket, of at least fifteen inches square.



It is very important that these feet wrappers should be well put on, and elastic socks should have been provided to keep them in their places: the stoppage, to replace them, will seldom be permitted; and exposure to cold in doing so may inflict frost-bite. The boot must not be tight, and no pressure should be allowed at any part: I fear the canvas straps on the instep of those now made may prove injurious.

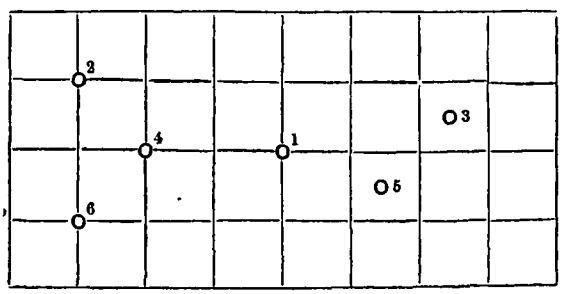
March 22.—At 7.30, temp. +22°.—The depôt-sledges, charged with fifty days' depôt for twenty-four men, or twelve hundred rations, independent of ten days' for the party, consisting of sixty-seven men, took their departure, under the command of Commander Richards, the remainder of the crews accompanying them to the point where they all made sail; each sledge being fitted either with sheers or masts, according to their separate idea of sledgemanship, and using the tent bottom, about nine feet by twelve, as a sail. They carried also with them a whale-boat and light ice-boat, on sledges prepared to support them. These, with the depôt, were to be se-

cured at Cape Lady Franklin, about twenty-five miles distant from our outer island, the party returning to prepare for their extended trip. The morning was fresh and gloomy, with the breeze freshening from south-east, temp. +22°; but as all were equipped and eager for a move, and I had not the least doubt as to the weather improving, I was glad to start them, and accompanied the little fleet to the outer point of the bay, where we parted, giving God-speed. As they receded and gained sufficient distance to be grouped, they resembled very much a small pirate fleet, no two preserving the same appearance of rig, and, as might naturally be expected at their onset, many failures and loss of spars resulted before they finally cleared the rough ice.

About ten, Mr. Allard's sledge, having broken down, with the whale-boat, returned: another was immediately equipped, and he was packed off again at 11.50. As I strongly suspected, Mr. Allard reported the ice to be soft in the cracks and very difficult for travelling; however, our scouts from the hill saw him moving on cheerily towards the outer island before nightfall.

On the 23rd the morning proved dull, but the day turning out fine, with a temperature varying from 5° to 10°, I took advantage of this lull to rescue our thermometers, buried in the snow-heap since October 25, but now sinking very perceptibly, owing to the general diffusion of water over the surface. The object in view was to prove the question, as to what distance or thickness of snow cold will penetrate vertically, or horizontally. Six's thermometers, if properly constructed, will register maxima as well as minima temperatures; but I must

candidly say, that I never saw but two that stood their work, and they belonged to a water-bottle, constructed for me for obtaining water and determining the temperature at extreme depths (twelve hundred fathoms or more), that could be relied on. The block of snow in question measured sixteen feet by eight on the surface, was eight feet in height above the ice of the floe, and constructed of large blocks of solid snow, cemented at the joints, or "pointed," with wet snow, which in a few minutes formed into ice. The interior was filled in and well trodden with loose snow, spars being placed where the thermometers were to be inserted: their withdrawal left firm cylindrical holes. Next to the more perfect operations of Dame Nature, this, I believe, comprehended all that was desirable. The diagram will exhibit the disposition of the thermometers, inserted when the temperature was at zero and their indices set.



No. 1, centre, 4 feet from N.E. and S.W. sides, 8 from N.W., 6 feet deep.
No. 2, 2 feet deep, 2 feet from sides.
No. 3, 3 „ „ 3 „ „
No. 4, 4 „ „ 4 „ „
No. 5, 5 „ „ 5 from S. and E., 3 from N.
No. 6, 6 „ „ 2 from sides.

But great confusion in withdrawing them occurred, by which all confidence was destroyed. The results I have; and they convey to my mind merely the fact that this bank of snow did withstand a much greater amount of cold than I had contemplated, but they were not spirit, nor reliable, instruments. About this period also, and whilst Commander Richards was absent to the southward, I tried several experiments on illuminating beacon poles by sheets of tin; a cask was also covered with tin-foil, etc.; but unfortunately the point where he landed was not in sight from the Observatory hill, where these marks were erected, nor did his track permit his noticing them. A variable or revolving heliotropic vane was constructed; but the cold, acting on the metal spindle and collars, did not permit it to traverse freely; it may be described in the Appendix.

The customary labour, and wear and tear of clothing generally, in the construction of cairns, is overlooked by our superiors when they issue orders on these heads: one half-hour injures boots, mits, and clothing, more than can be conceived. Nor can the officer look idly on: he therefore feels, as well as sees, the necessity of providing special gloves or hedgers' mits for this duty. I directed extra boots and mits, faced with seal-skin, to be issued to the cairn builders of my own division, where these duties entailed on them especially, this laborious species of work, and for which no provision had been suggested.

In our present occupation of adding to the building on the summit of Mount Beaufort, day after day, using carts to bring up the stones, the wear and tear of clothes

was also found to be very tedious.* Independent of our instructions, the would-be monitors, who write to see themselves in print in the public journals, insist on our building cairns in even *impossible* localities. If any of these should be honourable (right or wrong) Members of Parliament, I would advise them to amend the next vote for Arctic Service by the increase of the supply for the purchase of gloves, etc., as well as of some simple succedaneum for the cairns themselves. It is not often that stones can be found, and when found, that they can be detached from their ice-bound beds. Many shovels and picks† are destroyed, which break easily in cold weather. Our predecessors omitted to hint at this; indeed many here have kept their secrets most religiously, to our discomfort. But it is really grating to my feelings to hear the oft-repeated tale amongst my crew of "how many pairs of mits they bought, how many were supplied by Government, and that they are now reduced to take up Purser's." In this manner the Commander often hears very unpleasant truths, beyond his power to remedy!

March 25.—The depôt division having departed, and left me free, I determined to avail myself of the interval by exploring one of the creeks at the southern end of this Sound, which seemed to promise some chance of connection with the Northern Sea. I was under the impression that it might possibly, by slight portage, enable

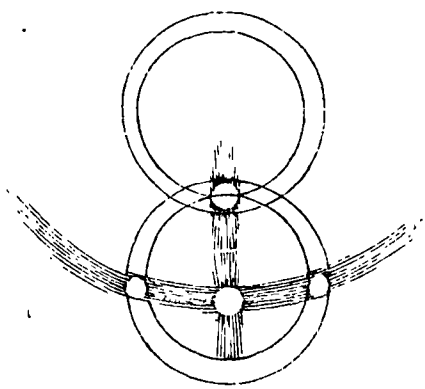
* In England pay might enable a man to devote part of the sum given for the endurance of such a climate: but no money here could buy a serviceable pair of gloves or clothing!

† All these tools were wretched, very inferior *even for ice*, and kept our blacksmith constantly employed.

us to throw across our depôts, avoiding some days' troublesome and circuitous travelling. Accompanied by Mr. Loney, and a sledge crew of six, with four days' provision, and the Cape York dogs, we started this morning about eight A.M., under the "Blanche" banner—"Bright eyes for brave hearts." The bright eyes prevailed: temperature —5°, wind in our teeth! We reached the entrance of this creek about noon, where we lunched, and I ascended the peninsula, to make sure which of two openings I would select. The south-eastern appearing to offer greater advantages, I decided on it. As we advanced, the deep ravines and steep beetling cliffs seemed to invite a more distant lead of inlet easterly. The wind was now not only sharp, but strong from the south-east, rendering it difficult, over polished ice, denuded by the wind at every swell, from keeping our feet or making progress. This was more particularly experienced under the glacier of Mount Blanche, and its high cape within, which reminded me of the gales off Cape Sicie of old (do they blow since the Peace?), and this appellation I bestowed upon it. It resulted clearly from the configuration of the land, as the breeze altogether ceased as we passed into the depth beyond. Recent deer-marks,* or those of musk-oxen, were noticed on the snow patches of the peninsula, but *side by side*, as if four animals had walked *abreast*. But these snow indentations are so very deceptive, that I do not place great reliance on them: one head is worth a thousand feet. Our journey ended

* They were not deer-marks, and the late appearances in this country induce me to think that this form is frequently produced by *snow-drift*.

about four P.M., at the further (south-east) end of the creek; but the valleys evidently connected, north as well as south, with the other interior openings, particularly towards Hungry Island. During the time the men were occupied in pitching the tent and preparing supper, etc., I strolled up the mountain until I almost "found myself" on a commanding eminence, about eight hundred feet above the level. A cursory glance around satisfied me that all my anticipations, either of advance or retreat by any of these ravines, must be entirely quashed. Still, as several heights easterly might serve to tie the work of this season (in prospect), I determined on the morrow to make an inland excursion, and place a beacon where any eminence to the north-east offered, likely to afford such a desirable connection.

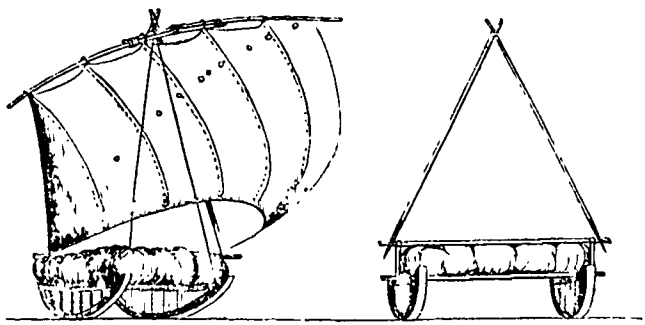


The fine drift-snow blown off Cape Sicie, and continuing suspended about that level, produced some very beautiful parhelia, dividing the arc contained between the zenith and horizon into three spaces, and forming four illuminated spots, the prismatic colours varying mo-

mentarily in intensity. The distance we had travelled on ice was estimated at ten miles: I notice by the plan that it was fourteen.

March 26.—Temperature —7°. Our night in the tent, being the first of the season, notwithstanding the temperature did not fall below —7°, and calm, was much complained of by all; and when a bright morning afforded hopes of comfortable exercise at this temperature "over the hills and far away," it was unfortunately accompanied by a troublesome fresh breeze from south-east. It is not to be understood that temperature here is concerned, because —10° is the approved degree for travelling—is pleasant, to our feelings balmy; but a cutting south-east wind, charged with fine drift, on the mountain-top, breathing heavily, is no pleasant "barber." As we surmounted the hill-difficulties we were surprised to find around us gently undulating surfaces, at times so perplexing in the distance as to confuse the senses, and cause one to deem them floe (or what would be level sea). Frequently did I observe, "Well, there at least is good floe to travel on;" but very shortly this vision was dispelled by the intrusion of some headland presenting a very much lower level. Upwards of four hours we continued to advance to the north-east, gradually ascending in the hope of catching some glimpse of the North Sea. Glimpses of the horizon I certainly obtained at times, through long lines of distant ravines; but the northern mountains, added to the great haze, put an end to all hopes of any proximity to the northern water. Selecting therefore the nearest eminence, with regard also to building materials, a conspicuous cairn was constructed,

seven feet high by nine feet in diameter at base, and of such substantial stones as will last more than a season. My own impression was that I saw some point or island through the valley. Time did not admit of further progress, and that securing return before dark now became important. The cairn which we had constructed afforded some little shelter from the cutting breeze, and under this we lunched. Cold meat, of course, and a cutting cold atmosphere,—for the temperature had fallen, and our men were *feeling it aloud.* Between the snow-dust clouds I could now and then distinguish certain objects, which satisfied me that I had reached the hill which I had contemplated from the Observatory. Our packing up, and forward, or return movement, was rapid;—so much so, that when I found myself at the tent, I resolved on seeking a more convenient shelter for the night.



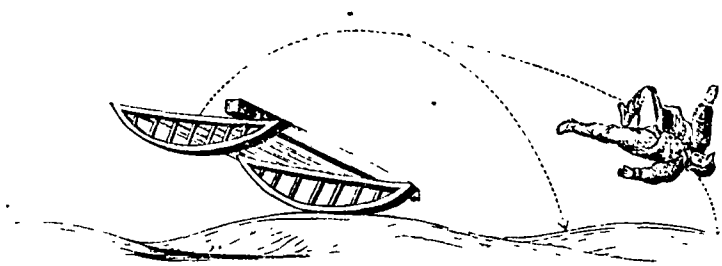
We therefore packed up, and started under canvas. Our craft was rigged in the most approved Sooloo pirate style: sheer masts stepped into a specially fitted batten, forming an isosceles triangle, with the means of support

by shrouds from its extremity, greater by two feet than the width of the sledge, which had also been increased for carrying the ice-boat, and our tent bottom was now formed into a well made sail. We were therefore "ship-shape," and might easily be mistaken for a gig under her customary lug; or, in case of very reduced canvas, it could readily, by elongating the yard, constructed of one bamboo and one tough mahogany flag-staff, be converted into a latteen (in the line of holes from tack to yard-arm).

I have before alluded to the floe we came over, head to wind. Our progress now was somewhat swifter; but of this very uneven and extraordinary floe I would now speak. Whence arises this wavy, glassy ice, undulating at such a very sharp pitch, viz. about two feet rise from the level hollow to the vertex or crown of the succeeding arch, or on a chord of thirty-two feet, about two feet difference of level?

The age of this ice—and it pervaded all the portion subject to this windy part of the strait—appeared great. The only rational cause to which I could assign its formation was the channelling by summer thaws and the forcing the water thus produced by the prevailing gusts over the irregular ridges, on which the sun did not act: this is the more probable, inasmuch as some of the intervening spaces, covered by the snow, presented smooth, clear blue, level ice, in long spaces, evidently where the water had been quiescent, whereas all these abrupt swells were composed of grey ice, rough, and abounding in air-cells of the size of hemp-seed or peas. As I before noticed, within and without this strait it was not met with; there the ordinary level snow-clad floe prevailed.

We left with a gentle breeze, under all sail, going at a very pleasant trot beside the sledge, until we came upon this rough sea. The velocity of the sledge, caused by the sudden increase of wind under Cape Sicie, tripped all hands up and dragged them astern, face downwards. I was on the sledge, and dropped myself in time to avoid the consequences of the capsize which one of these waves caused. We escaped with one damaged spar; replaced it, and moved forward more cautiously. This time our engine ran away; again all hands let go. I was perched, for ballast, on the weather-quarter, across which a long gun-case, three feet six inches, was lashed; but, as if my neck was destined to be continually in jeopardy, I experienced a gentle summerset, driven at a radius of four feet, with sufficient impetus to derange it;



however, I escaped with slight damage, and the sledge upsetting on a lee shore, enabled our crew to regain it. We now reduced our sail to a latteen until we cleared this frozen ocean, and eventually pitched our tent for the night on a fine gravel beach. This I well know, by experience, to be bad; but as the majority seemed to think they had bettered themselves, I was determined to let them learn, and not have to thank me for my inter-

posed authority. *Experientia docet*, when men can be made to understand it; however, stone will, like metal, take a lower temperature than snow, and will of course abstract heat in a similar proportion. Each complained of greater cold. I was silent; some smiled, few slept, but all were very glad when chocolate was ready, and it required no second call to rouse the slumberers. Dry gravel, under summer sun, is however very warm, and to be then preferred.

Striking our tent, we now moved on for the ship, but I soon found that such antics do not suit my present constitution, and that severe spasms of my right leg compelled me to use a compress. We reached the ship at eleven A.M. on the 27th.

On this short excursion we fortunately discovered the inadequacy of our cooking-lamps either for stearine or spirits-of-wine. Instead of brazing, they had been simply soldered, and the first time the spirit was used, the supply-tube fell off, the spirit (the entire day's allowance) was lost, and the tent endangered; and yet these things are put into the hands of the proverbially "careless and inexperienced seamen!" What mechanic could dream of burning stearine or alcohol in soldered vessels! even the nozzles of the tea-kettles were so secured! Doubtless the Government paid very handsomely for these inefficient claptraps, but our blacksmith had enough to do to keep them in repair; indeed we were lucky to obtain him, for the steam department did not aid us in such matters, beyond helping the blacksmith in tin-work and at the bellows. These matters at first sight do not occur to the uninitiated, but they are pregnant with danger,

as well as inconvenience. Let us suppose that we had started with spirits only, as intended; but in this case we had a small supply of stearine.

First act: spirit-lamp defective—feeding-pipe falls off (soldered to the side and bottom, instead of top). The alcohol flowing round and below took fire, and destroyed the lamp for use. If I had not been present and made a substitute, all the fuel would have been expended. But let us imagine that the tent did take fire, what would be the condition of the party? First, loss of shelter, and, from the attempt to extinguish the fire, inevitable frost-bites; the result, loss of members bitten, or life! But there are other miseries; without fuel, neither water, tea, nor chocolate to drink, could have been procured; and thirst at this season, particularly at the commencement, is intensely felt; but had such an accident occurred at the outward limit of a journey, the result is fearful to contemplate! What then, I may ask, would be the chances in this region for our missing countrymen, if they escaped from their vessels? Fuel, even in savage life, is requisite.

Truly these preparatory journeys are valuable; they point out our wants, and direct us to supply the deficiencies. Already each Government stearine-lamp has been replaced by our own ship-made, and a composition formed with two parts of whale oil and one stearine, cast into plates, with wicks included to fit them, supersedes the lamp, so that lighting the fire is simply lighting the candle of some eight inches' diameter. Some for my own sledge were formed from bees-wax and oil. The spirit-lamp for my own sledge was superseded by a cop-

per vessel, hammered out of the solid, with six lips for wicks, affording the facility of adding oil, or walrus, bear, or bacon fat. These two light and simple articles are available for any purpose. Our copper vessels have been riveted and brazed, but the kitchen itself, the outer casing of tinned iron, is already asunder! How many years have they been warranted to last? Gone before one season! Very stringent orders will be given to preserve their remains for future service. The test which I would prescribe for all such articles, in copper (to be tinned after), would be boiling oil: if they stood this they might be received, not otherwise.

Our appearance, short as our absence had been, brought officers and crew out to help us: to that comfort we were anxious to reach, for our cruise had somewhat shaken me, and the constant talking of cold which the men experienced, made me far from comfortable.

March 29.—Our anxiety for the return of our party kept me very often on the hill, and today, turning my telescope towards the outer points, where I intended to place some beacons, I noticed dark objects in motion: ducks they could not be, but, deceitful as the atmosphere is on the ice, I was soon able to discover that they were the heads of our sledge crews, rounding the spit of ice off the outer island, when they all, strange to my mind, pitched their tents on the spit. I was not long in sweeping the island crest and discerning that this motion was connected with parties cairn-building; and after constructing two, they rejoined the tents and advanced. Affording them time to make their march, I took the direct path to cut them off, and joined them about two

miles from the ship. I was glad to find them all in health, high spirits, and free from casualty; but I could read clearly that this trip and return had proved of great importance, and rejoiced I was that they were prevented from proceeding until they had refreshed themselves and remedied deficiencies discovered on this first brush. It had proved a work of labour, but the difficulty was now diminished.

In condensing the able report of Commander Richards I shall use his own words, omitting only passages of detail, which will probably be printed in another form. The date of starting, etc., has been already stated as the 22nd of March, at seven A.M., temperature 22°; the sledges being commanded as under:—

The 'Sir Edward'—"Loyal au Mort" . .	*Commr Richards.*
The 'John Barrow'	*Lieutenant Osborn.*
The 'Reliance'	*Lieutenant May.*
The 'Enterprise'	*Mr. Allard.*
The 'Sir F. Baring'	*Mr. Ricards.*
The 'Perseverance'	*Mr. Pym, Mate.*

57 men and officers; depôt, 1200 rations; provision, 570.

"The wind fresh from south-east, and weather hazy, we started under sail, steering for Spit Island west extreme, and accompanied for a short distance by the Captain, officers, and remainder of the crew. At ten A.M. we got amongst hummocky ice, and the sledge 'Enterprise' capsized with the boat, damaging herself so much that she was sent back to the ship to refit.

"About two we encamped on the low western extreme of Spit Island, to await the return of the 'Enterprise.' At five the 'Enterprise' rejoined with her boat: George

Youngson, of the 'Perseverance,' fainted at his sledge, but a little brandy, and his dinner, recovered him.

"*March* 23.—Calm and foggy, + 8°. Started at seven A.M., and came almost immediately to heavy ice, which we dragged through all day, with severe labour to the men and damage to the sledges. It was a perfect frozen pack, which we were obliged to cut our way through with pickaxes. The snow-drift very deep between the hummocks, which we found of use in making the road with. Two walrus, an old and young one, were wounded today in a hole of water, but were not captured. Encamped at 4.30, and patched up the 'Enterprise,' which sledge had suffered severely among the hummocks.

"*March* 24.—Light wind westerly, with thick weather. We started at 6.45; at 7.35 came to better ice; at 11 lunched: nothing important.

"*March* 25.—At seven A.M. started: wind south-east, fresh, and hazy. Cut a road through a confused heavy pack with picks and shovels, and after five hours' labour succeeded in accomplishing little more than a mile, when we reached an old floe, halting at noon for luncheon. A bamboo and flag was left to mark this, 'The Queen's Causeway.' Encamped at 4.30. Wind strong from the south-east during the night, and the tent very cold.

"*March* 26.—Wind south-east, strong; weather thick. Started at eight A.M.; scarcely able to see thirty yards ahead for snow-drift. Many slight frost-bites* occurred amongst the men. At 11.30 halted for luncheon; although close to it, no land in sight; moved forward, being too cold for undue delay. At 11.50 saw Cape Lady

* Frost-bites temporary, removed by snow or warm hand.

Franklin close to us. Ice very uneven in-shore, and the stupendous hummocks which line the coast, and which must have been pressed up by a succession of north-west gales, are between seventy and eighty feet high: I should say that they have stood the thaw of many summers, and seem little affected thereby. The old floe which we picked up yesterday did not carry us to the south shore, but a narrow belt of new ice intervenes. At 12.30 we landed on the south shore of the Queen's Channel, and planted the Union. The depôt was placed on a sloping point, about eighty feet above the sea-level, and one mile from the summit of Cape Lady Franklin, east of it. The point is projecting, and is computed to be the nearest land to Spit Island; the heaviest hummocks of ice are grounded on it. The depôt consists of the boat turned bottom up, with the other stores placed under it. Over the boat a flag was hoisted, and the customary record in a tin cylinder left."

The vegetation on that shore appeared to be more abundant as well as forward; traces of deer noticed; formation similar. Ascended the higher land; noticed eight or ten deer feeding in pairs in the valley westward: two passed within fifty yards, the doe and fawn. The return to the ship is but the outward journey reversed. Canvas boots approved, as well as blanket wrappers. Carpet boots decried for travelling, causing sore heels to those who used them. Commander Richards is satisfied with the allowance of provision, but objects reasonably to mixture of pemmican and preserved meats.

The sledges have been much strained by rough ice: that belonging to Commander Richards so much shaken

that it must be replaced. One missing, either buried in the floe, or in the snow on shore: the latter might be recovered. But the peculiarity of losing anything on the floe may be readily understood by the fact, that a snow-house and block for thermometers, constructed on the floe *level* in October last, are now just even with the surface snow, or the level of that of the snow-bank of our port-beam, fourteen feet above the solid ice. As the season advances, and the *sea* increases in temperature by the great amount of thaw beneath, the ice is removed from the *lower* surface, water percolates, and the upper mass freezes; and, as a matter of course, things which occupied the upper icy surface in October, must be sought for beneath it in May. Those which float may be recovered, but it may be possible that a pile of bottles, owner unknown, may yet be extricated at the mouth of Wellington Channel. In November I heard rumours of such losses, and directed all tins and bottles to be removed to the land, that no such accident should mislead parties as to our fate. The hills have not been, so to speak, snow-clad during this season: any strong breeze denudes them, and the earth is in places ever visible.

I cannot take leave of the month of March without some remarks on its peculiar character. Of the early part of the month, or first half, I have already made my extracts. From the 16th, the + sign prevails as high as 24°, the minimum being —18°. This, by referring to the comparative table of the two 'Hecla,' 'Enterprise,' and 'Resolute' voyages, is contrary to precedent, no *plus* sign occurring at all! The following comparisons will show the great peculiarity in this month:—

	Maximum.	Minimum.	Mean.
Assistance (1853)	+24°	−55·5°	−17·75°
Hecla (1820) . .	+6	40·0	18·10
Enterprise (1849)	+8	51·0	22·80
Hecla	−9	47·5	28·37
Resolute . . .	−8	44·5	25·70

We have experienced the month nearly divided between intense cold and (*to us*) intense heat! Between the 16th and 26th we experienced a change to a mean on ten consecutive days of +5·593°, and on seven consecutive days +10·627°; the maximum being +24°, minimum 17°.

I take leave of it, and bequeath it as a legacy to the speculative theorist at home.

CHAPTER X.

The Cairn.—Anticipations.—South-west Expedition.—Tidal Motions.—Return of Mr. Loney.—Dog Killed.—Letters from Pullen.—North-east Expedition.—Tent Arrangements.—A Cold Bath.—The First Depôt.—A Wolf.—Princess Royal Island.—Tidal Rents.—Snow Blindness.—Mount Parker.—A Whale.—Hamilton Depôt.

April 1.—The summer heat has already informed us that our pile must be rebuilt, and that snow or *frozen stones* are not fit materials for any weighty structures. The basement, constructed of substantial stones, is firm, but the sun acting on the surface has thawed all the loose ice-bound matter, and now compels us to reconstruct the upper part, which has fallen: a practical lesson on all cairns built before summer.

On the 2nd the weather proved fine; a party was despatched to rebuild Mount Britannia beacon afresh, and to look around on the ice. This beacon was surmounted by a blue and yellow flag, and adorned with many preserved meat tins, flattened out, and hung in such positions (with their tinned surfaces outwards) as might afford a glimmering ray, from these heliotropes, to the southern travellers.

A specimen of the stone brought to me today from Spit

Island appears to be a bituminous shale. It might serve, with coal, to keep up the heat, but I do not find it to be capable of burning or maintaining heat, unless so aided.

When I look back to my order, issued in February, "that the sledges were to be ready to depart on the 15th March," I confess that I am somewhat astonished; possibly other matters before this cruise is ended (?) may be as satisfactory! But with the summer this habit seems to decline. To my own mind I think I could have found very plausible reasons for anticipating the preceding events; but beyond my conception of the direction of my intended route to the north-east, I have nothing now beyond guess to help me through the summer. Hope I will, nevertheless: that can never be denied. Indeed, without some preconceived opinion on such a service, how am I to frame my orders? Surely not on the snail principle: "nothing risk, nothing gain."

I notice the following amongst my rough notes:—"I like calculations ahead, and shall divert myself with another pet theory. I have noted generally that a warm or forward spring in cold climates, even in England, is seldom checked by any return of cold. In April, 1852, we retained a cold spring, and carried it to Greenland, not experiencing a greater maximum temperature from 1st May, at and after quitting Stromness, than 50°. Summer we did not experience, 45° being our maximum summer temperature in August. On the 8th, at noon, the moon changes; and about midnight, on the 9th, we may expect a decided change. If a gale ensues from south-east we may expect high temperatures, but no travelling. I shall direct the south-western expedition to be ready to

move on the 10th. In arriving at this determination, I think I am even late. The minimum temperatures generally occur when the travellers are in their blanket bags, and the cold is not so much perceived. To have been present, and watched our changes, might have furnished food for ridicule.

April 10.—This morning, at two A.M., our attention was intensely on the alert.

At Midnight	−21°
2 A.M.	−16
4	−14
6	−8·5
8	−4
10	−2
Noon	−5

It had been arranged that Sunday, 10th of April, should be the starting day. The sledges were laden and inspected on Saturday evening. After special prayers on Sunday, the crew were allowed to sleep until four P.M. I took an early dinner with the officers, and shortly before four the sledge banners were presented, and their commanders and crews severally addressed. An address was also made to the crew generally, and the entire banners being displayed, fluttering in a north-west breeze then springing up, and adding a fresh spur to our eager hands, we took leave of Richards and his gallant band of six sledges and fifty-seven men, gliding forth from our remaining banners, with feelings which I am unable to commit to paper. The division comprised the same sledges as before, Mr. Herbert now taking the 'Success' and Mr. Grove *pro tem.* the 'Enterprise;' Dr. Lyall the 'Lady Franklin.'



E B del.

Forrest Brothers Lith.

Departure of South West Division.

Each sledge was stored with forty days' rations for the number of men (fifty-seven), making the average draught per man about two hundred pounds. Commander Richards was the bearer of despatches for the Admiralty, *viâ* Melville Island, as well as others for Captain Kellett, to be left at the previously ordered rendezvous in 77° N. and 105° W. The arrangements contemplated the Commissariat sledges to aid Commander Richards until he had reached the meridian of 110°, when he would have forty days remaining, and adequate depôts secured for his return to Cape Lady Franklin, where the whale-boat, with sufficient provision, was already deposited; he was also provided with one of the light ice-boats.

The little fleet, having at this time their masts better secured, sails reefed, and their Commanders having in every way gained experience from their former trip, now sailed away more "ship-shape," and were soon lost to our view.

One great feat complete, I had now to revert to my own course. I had heavy difficulties to contend with, but go I must: I could not leave such an important trust to any one I had here. The first step was the completion of my official correspondence for the Admiralty, to be deposited at Cape Becher, where I fully relied on my emissary being met by one from Commander Pullen, if he himself did not come.

April 11.—The weather continuing to hold out the prospect of moderate temperatures, our mean being above zero, I determined on despatching two sledges, under the command of Mr. Loney, aided by Mr. Allard, to lay out our first north-east depôt. This was also in-

tended to feel the way for our boats, which would have to travel in that direction, as well as to determine the actual state of the ice in that exposed locality, for I had my doubts of a permanently frozen sea throughout the space beyond Exmouth Island, and the region westerly and northerly.

April 12.—On the morning of the 12th of April they started. About eight A.M. the thermometer ranged on either side of zero; on the 13th the temperature fell suddenly from —6° to —12° and —19°; and at four A.M. on the 14th to —25°, attended by strong breezes from the westward. This continuing until the 16th, I did not give them credit for contending against such difficulties, particularly the snow-drift we have experienced: I certainly expected they would, to use the Arctic expression, have "bagged," or slept in their tents. These breezes seem to have a surprising influence on the tides, and this renders me still more anxious; for when they once become active, the sign is infallible, to my comprehension, that, like a mob, there must be vacant space somewhere, from whence they came, and to which they can return: nothing but open water, northward or westward of this channel, can effect such motions. At one time I had some suspicion that the tide-gauge was foul, but it moved too freely, and the customary ice-cracks, termed bolts-cracking, have of late been more loud and frequent.

April 17.—One week has elapsed: in three days Mr. Grove will probably furnish me with the gratifying intelligence that the division has safely reached the southern shore. Climate and winds differ here so widely within

a space of ten miles, that it is quite impossible to calculate on the weather they may experience. They are all sound men, and well attended, and will, I am satisfied, do their duty, especially my own crew.

April 19.—I cannot sufficiently express my satisfaction when one of my own followers exhibits a pattern of smart work. Under all the difficulties I anticipated, I find Mr. Loney returned, and his work satisfactorily executed, two days within the time. He had deposited the *cache* eight miles to the north-east of our furthest station of last year, and had from thence a good view of an island seen by me (as *in nubibus*) from Exmouth Island. I then (on the 28th of August) directed Commander Richards to look for it from his more advanced stations, but he was prevented seeing it, owing to thick weather.

The party experienced very severe cold, travelling head to wind directly against heavy snow-drift, but without a single casualty (my own well-tried sledge crew); snow-blindness and trivial frost-bites (*alias* cold fingers) being the only difficulties.

The day after they quitted us, Mr. Loney, accompanied by Mr. Allard, being somewhat ahead of the sledges picking the way for the men, encountered a bear steering direct for them. At first they mistook him for a dog, and, being unarmed, they reversed their engines, and dropped upon the sledges, Mr. Bruin trotting up most fearlessly to attack the party. However, his assurance cost him his life, but not before he had struck his awful fore-paw into the fore-shoulder of the leader of our Cape York dogs, and literally torn it out, rendering it necessary to put an end to his misery: he was the

finest of a most peculiar and very handsome breed, obtained at Cape York. As I had suspected, the water in the Main-tide Channel, between Pioneer Island and Village Point, was open for half a mile, but on their return was again skimmed over, probably under a —25° temperature. This and one or two other air-holes noticed will probably break up the moment the sun has a fair view of them,—they are directly in the course of the strongest tide. One other bear was seen, but he was too wary to trust himself in such company.

April 20.—This being the appointed day for the return of the first sledge from Commander Richards' division, shortly after noon the banner of the 'Dauntless' was seen, and about 1.30 Mr. Grove returned, the bearer of a letter from Commander Richards, reporting all well, in high spirits, and informing me that all was going on smoothly, no casualties, and that they had made good forty-five miles against these adverse gales, which ranged from north to north-north-west, with a temperature not lower than —27°, it being then —17° in the tent where he was writing!

A sledge having been prepared, with ten days' rations, for the conveyance of the despatches to Cape Becher, they were entrusted to the charge of Lieutenant Cheyne, under the 'Victory' banner. This left me about eight days to complete my arrangements for my examination to the north-east, unless intelligence by Dr. Lyall, due on the 2nd of May, should interpose any difficulty. Our artificers were busily engaged re-manufacturing cooking gear: indeed, every sledge that returns reports something amiss. In time we shall be perfect, but it is really

disheartening to start for ninety or a hundred days under such apprehensions; not as regards myself, but for those who have already departed.

On the 28th, about 3.30 A.M., Lieutenant Cheyne returned, informing me "that he had brought an 'English mail.'" The report surprised me. However, a very few minutes decided that he had made an egregious mistake: he had brought one or two letters and newspapers, but the "despatches," as noted in Commander Pullen's note, were left behind. Two packages were clearly indicated. This note of Commander Pullen's puzzled me not a little. Commander Inglefield had arrived in the 'Isabel,' bringing "despatches and newspapers," copies of which were also deposited at Cape Phillips.

This unfortunate mistake, at such a moment, worried me not a little: but considering that Commander Pullen must be aware of any material change of orders, and would indicate it in his *sealed* note to me, I resolved that no orders or despatches had arrived. However, having given Mr. Cheyne fresh instructions to retrace his steps, and find the despatches on the return of Dr. Lyall, I commenced my preparations for the march.

I fully intended to proceed on the evening of the 1st of May, but I was too unwell. Another cause, perhaps, had also some weight in causing me to delay: I was very anxious to include in my last report any intelligence of which Dr. Lyall might be the bearer, and as that officer was also eventually to join my division, I wished to confer with him before starting. I fully expected his arrival early on the 2nd; our preparations were complete on the 1st.

'Londesborough' . . 7 men, 2 officers, 40 days' provision.
'Dauntless,' Grove . 7 „ 1 „ 40 „ „
'Enterprise,' Allard . 10 „ 1 „ 50 „ „
28 men, 1230 rations.

We were also attended by the sledge-boat 'Hamilton,' under the Blanche banner, two Cape York dogs, and three pups. Our patience being exhausted, at six A.M. on the 2nd we took our departure from the ship, not inaptly termed the "Deserted Village," cleared the Sound, and before noon found the sun, with a temperature between +3° and +6°, unpleasantly *oppressive*.

The 'Hamilton' was at first attached to the three sledges, but it was subsequently found preferable to attach her solely to the 'Londesborough,' taking reliefs of four men from the other two sledges, as circumstances required.

Several seals were noticed on our journey towards Village Point, but all too wary to permit any one to get within shot. Indeed, unless these animals are instantaneously killed, they preserve such a convenient distance to the hole in the ice, that their dying agonies alone would cause them to slip or wriggle through before they could be secured. As the snow was deep and soft, and the day warm, our sledges, cutting deeply into the snow, made but slow progress. I therefore walked on, accompanied by Messrs. Grove and Allard, reaching Village Point about 2.15. Here we found a large sheet of water,* extending nearly across this narrow strait, and about one mile in length, in which several very inquisi-

* Today the open water was also noticed, extending from the south point of the Sound to Spit Island.

tive seals were playing, and frequently raising their busts out of water, as if to inquire the cause of our visit. About 4.30 the sledges reached the low point, when we encamped for the night, the men much blown and fatigued from the effects of the sun, which already produced symptoms of snow blindness. It is yet an unexplained fact, but we found a broad and deep sledge-mark in the gravel from the cairn to the point. Part of the officers and crews of every sledge which had visited this point last season were present, but no one could recall to mind any sledge taking such an unusual direction, and dragged, too, entirely on gravel: most of them had crossed at right angles; but the runner width exactly coincided with that of the sledges used last season, and therefore I conclude must have belonged to our Expedition. At our first encampment the temperature at six P.M. was $+9{\cdot}5°$, and the prevailing temperature during the night was about $+15°$ in the tent, with $+10°$ outside.

About seven A.M. on the 3rd we moved forward; weather not pleasant, but better for travelling: the temperature at starting was 10°. Our object at present being to make the shortest cut over the space examined last season, we steered for the depôt point, passed near to the wrecks of dog and bear, left by Mr. Loney, of which the rib-timbers were noticed, probably picked by wolves and foxes; and about six, finding that the inshore course would lead us through very rough ice, we pitched for the evening at the south end of Coffin Island, which afforded us most convenient shelter from the then prevailing wind; the temperature had fallen to 5°, and at midnight reached zero. Here we constructed a cairn,

cooked pemmican and tea, and withdrew into our shells. I shall merely notice one day's routine, to mark our mode of life, or change from that of last season. The pemmican is now so well known that it hardly requires description: however, we had four varieties: the first made with currants, herbs, etc., pounded beef, and suet; another sugared; another plain; another herbs; marked C. H. S. blank. Of this compound three-quarters of a pound was found sufficient for each person, to which was added one ounce of maccaroni, or four ounces of potatoes, onion powder, sage, etc., *ad lib.* Of this food I was not fond, and one ounce was enough for me; latterly I avoided it entirely. Our tea was of the best quality. Sleep we had to provide. The bed, although already described, I shall repeat, is a bag constructed of thick grey felt; this bag is about seven feet in length and three feet in width, allowing a man, when in, to double the top over his face, like a long *envelope*, and endeavour to suffocate himself by his own heat, until that becomes inconvenient, when he seeks a breathing hole. This bag, I had almost forgotten to remark, is covered with a prepared casing of brown holland, supposed to retain the air. It is not easy to enter or emerge from this bag, especially if the alarm of bear, fire, or water, should be given, as the aggregate living mass is covered by another heavy blanket, made fast to the tent-poles at the officer's end of the tent, to keep him down until the rest escape: he is also placed at the weather or extreme end, to keep the cold out, as the *place d'honneur;* and to shield him, a further strip of this brown holland, furnished with pockets, to place small articles in safety, affords further protection from

the piercing wind. But to the main protection between the snow, ice, or cold gravel, and the body: the "feathers" (Macadamized bits) being removed, a Mackintosh cloth covers the flooring; on this is spread a blanket of buffalo skin, but this also was meagre; frequent wet caused the hair to take leave and enter the cookery, and eventually, until indignantly turned out, it was reduced nearly to spotted parchment!

It is almost needless to excite the sympathies of those who can soundly sleep on the roughest gravel, or piles of shot, and whose bony projections are calculated to withstand any inconvenience; but, *pour moi-même*, I am getting tender, and I feel the difference between true and fictitious feathers; and the cold, which at first chose to make my dorsal column its immediate point of attack, was very sensibly felt; but layers of non-conductors eventually remedied this: habit too (like the eels) inures one to suffering. Tent discipline continued: at a certain hour the cook is called: I never knew a cook call himself. Why should they sleep more than any other member? seeing that they have the same time allowed, and change daily: probably the last cook being the very foremost to call his successor to a sense of his duty. Our fires were candles, therefore soon lighted; but the cook had to procure his snow and thaw it, before he obtained water. When this could be coaxed to boil, the chocolate was put in, and the word passed, "Cocoa ready." Heads emerged, pannikins produced (tin-pots holding *just measure* one pint and more each person), biscuit is served out, and breakfast soon despatched; no waiters to pay, no chambermaids. The luncheon-grog is

mixed with the water from remaining fire (now available): luncheon put into the "scran-bag," and "Down house—break up!" Such, reader, is the delightful process of the Polar travelling gentlemen, to be understood in future as "started" = after breakfast, etc.; "pitched" = or erected tents, cooked, and went to sleep.

On the 4th of May, at seven, moved forward for Star Bluff, but heavy packed ice—fragments of broken floe, cemented together by frost—(only to be compared with the roughest rocky travelling over disrupted quarries) rendered our progress difficult with our heavily laden sledges; we were very glad to "pitch" five miles short of it.

About eight A.M. on the 5th we moved forward, and on closing Star Bluff we found the ice becoming very tender. I thought that the off-shore ice would prove firmer: it was so, but I did not go sufficiently far, and in the attempt to make a short cut, to avoid one of the most apparently dangerous spots, the leading sledge broke in. Here the trusty 'Hamilton' did good service; she was soon floating beside the sledge, and safely were the goods transferred. The instruments were safe, and I was on the point, carrying the theodolite-legs in my hand, of seeking a secure spot, when I found myself suddenly immersed in a bath, by no means acceptable: it might have been an intentional interpretation of C. B., but it was beyond joke. The current beneath the ice ran very strong. I had the chronometer on me, and, unless I was soon rescued, I should be missing under the ice! At present the legs of the instrument across the hole sustained me just enough out of water to pre-

vent wetting the chronometer. A track-belt thrown to me, and connected with others,—for it was dangerous to approach me,—soon dragged me out like a walrus, and all was right. The present condition and safety of our wardrobes being a matter of considerable doubt, Mr. Grove most kindly clothed my lower extremities until matters were accommodated. Our only loss was ninety-six pounds of bread and some pretty considerable dampnesses. The gutta-percha cases for bread proved too brittle, and split; they are certainly not adapted to the rough handling of seamen: no man who cannot understand (and feel for) them should be entrusted with, or can derive advantage from them; they will not stand rough usage. The bread thus damaged was buried, and a cairn erected to mark the spot, so that, if distress required us to fall back upon it, we knew where it was deposited. But many of my readers would doubtless like to know how I relished this cold bath. I will describe it in a few words. The unexpected immersion was not pleasant: when in for it, I cared little about it, but the tide and safety of chronometer did not allow me to enjoy it: the cold was not felt, but a glowing sensation prevailed until I recovered my customary dry clothing. Moving forward towards Star Bluff, we pitched about seven that evening off it; but the ice proved too heavy to allow us to pass to the land.

On the 6th we pushed forward for the depôt established by Mr. Loney, but failed in reaching it by two miles; but on the 7th we succeeded in time to make it a rating position for the chronometers. Here we obtained the latitude and other important observations;

made good our deficiency of provisions from the depôt; anp last, not least, rested six hours. At this station a wolf came to inquire the cause of our visit: it was joined by the dogs of our party, and did not quarrel; but the animal was so unlike a wolf, and, supposing our Cape York dogs a little blanched, the extraordinary similarity of the remaining black lines so much interested me, that I issued orders for his "tabu," under a feeling that it might possibly be one of Sir John Franklin's dogs, and by petting would conduct us to some clue as to his people, or, even failing in that, to some tribe of wandering Esquimaux (Huskies is the only term used here). The bears had visited the *cache*, torn down the blue flag, but without disturbing the staff or the provision! Funny fellows they are! Why have tney such an antipathy to blue? Yellow is safe; possibly they fear *pratique*, as many bears *did* not many years since; but to have climbed this loose gravel pile, stood on hind legs, torn down the flag, and rent it as they did, is marvellous. Their general weight is about seven hundredweight; my own weight about one and a half, and yet I found it difficult to retain my footing on such a moving pile: they must be fairies! About eight P.M. we pitched two miles short of a low gravel point, having in sight the new island seen from Exmouth Island on the 28th of August last; distance six miles, the temperature +4°.

May 8.—On the 8th the division moved forward about seven, but about eleven I remained behind with the 'Hamilton,' Mr. Loney, and two hands, to secure the latitude and other observations on a low intervening gravel island. This island is composed, as all here are,

of rubbly Macadamized magnesian limestone, abounding in fragments of fossils, scattered in every direction, principally Terebratulæ, Pectens, and Madreporites. At this position the value of our sledge-boat 'Hamilton' was practically evinced: our party had gained a start of at least two miles; they were under canvas; we made sail, and with two men, two dogs, Mr. Loney, and self steadying the boat, overtook the sledges with ease, at least two miles ahead, in the lapse of two hours. About six we pitched on the northern spit of the island, ascended its high-turreted peak, built a conspicuous cairn, and, this being the first important discovery and keystone of our operations this season, hoisted the Union and took possession, under the customary forms, of Princess Royal Island. At the base, with a temperature of $+6°$, the cold was felt sensibly; but as we reached the summit it became softer, and eventually comfortable. Those who deal with cold metal instruments, pencil and paper, appreciate these changes very sensibly: I consider 1° in the value of wind here to be equal to $-10°$ on the previous temperature.

This was Sunday. Our motions by day interfering much with our present mode of travelling, the customary observance was deferred until evening, when all hands were collected in my tent. These are matters of discipline. It is not my intention to inform my readers, or rather to trouble them, with the question of how good or bad we were, but possibly we may be found to Him who knows our secrets, quite as good as "the tinkling bells." In few words, and to the point, I merely observe, Let the reader peruse the incidents of this Work, and

ask, "Had we not cause to think deeply, and exclaim, 'If the Lord himself had not been on our side'?"

May 9.—(Temp. 2°.) On the low northern point of this island we deposited our surplus provision, leather boots, and every useless article of hamper which had been unfortunately, but stealthily, crammed upon the sledges, giving the crews some additional hundreds of weight not estimated in the two hundred pounds per man. My previous arrangement had contemplated the return of Mr. Allard from the depôt; but, having re-victualled his sledge there, we again moved forward, taking him five days further. I think I hear my good old friend, Sir W. N., exclaiming, "That confounded racehorse spirit!" etc. Well, be it so: the thought of what one once could do often impels a man forward: I thought my strength would enable me to return without asking any one to drag me, and in this I was not deceived. Our new friend, the wolf, still hung upon our rear, but not disposed to make friends, or quarrel, with our Cape York dogs: its habits are certainly very peculiar; it cares not for us, and frequently approached so near that it might have been shot; but it is *tabu*. Sailors are deemed superstitious,—granted; but let reason have its course. The canine species has not unfrequently put the biped to the blush. What sensible apology is there for shooting this, at present, harmless beast? and yet, by good fortune, or providentially, if but a dog escape to savage life (and those we have are but wolves), it may yet lead us to the last resting-place of his beloved master! Why then commit a mere wanton act of cruelty? The Queen orders he shall live!

Our course is now directed to a low point to the east-south-east, surmounted by a very remarkable mount, about a mile and a half within. The included segment between this and the outer point of Princess Royal Island forms a deep bay, evidently much cut up by numerous streamlets, flowing from extensive lakes, converting the entire space, if thawed, into one immense series of flats, mostly even with the surface: there is therefore at present no chance of sinking into this "mud flat floe." Upon this line of mischief, as all shoal lines are ("dangers" hydrographic), the pack ice was of course compelled to observe "the rules," and within it we obtained smooth, but, when cracked, slightly impeded, travelling. But to make this matter clear, and to mark this species of travel, it is requisite to bear in mind, that notwithstanding the incomprehensible masses of floe-ice which cover the Polar Sea as with a mere tablecloth of varied fabric, coarse or fine,—that the great laws of nature, the tidal influences, cannot be arrested. The huge floe must obey the law of floatation: it rises, cracks, falls possibly below, or is supported by some interposed substance above, the so-called land-floe, which refuses to move (possibly in our case because it cannot); is frozen to the bottom: a gap is left, filled in with light snow, and one very fatal to sledge runners, and uncomfortable to those who have no serviceable legs left, by finding the hips nearly engulfed in these cracks,—chasms more properly. It is therefore advisable to keep inside these *traps*, and rather observe the parallel contour of the land, or where the ice is solid, than to contend for short cuts over hummocky ice or frozen pack. I have thus

far travelled out of my road to explain fully the nature of the sealed hydrography of these regions, as well as to explain that Nature will exert her undoubted rights at the Equator as well as the Pole itself! On the power philosophical I need not dilate: the laws are too simple. I have stated its winter nuisance; add to this, for summer, the difficulty of landing, by reason of interposed bands of water near the beach, where the sun acts on the dark-coloured mass of the hills and beach, causing the water to flow freely between, long before the table-cloth can be pierced.

At our noon luncheon position we erected a snow pyramid, and, as it was not convenient to have it disturbed by bears, left a composing dose for Bruin, in the event of his revisiting this spot, his tracks being numerous just here: it is to be hoped the wolf will not taste it! Thinking of *Ursus maritimus* and the original astronomers, who placed Ursa Major and her cub at the Pole? It argues a knowledge that we cannot understand: it is the only true representative of the Polar bear! Is this "the sweet little cherub"? As one of our family mottoes is "Bear and For-Bear," I shall be silent.



PRINCESS ROYAL ISLAND: N.N.W. FIVE MILES.

May 10.—Morning fine, but hazy; temperature 6°. Wolf hovering; men complaining of sore eyes, resulting

from the sun's glare: doctor's shop opened, and various remedies applied—vinum opii, glycerine, tea-leaves, tobacco, etc. Each seemed to have his favourite remedy, and as there was no really bad case, it was as well to let them have their run of humour: for my own part, I was satisfied that a more lenient mixture of the vinum opii was preferable. Example does wonders: I established the daily wash of ten drops in a tablespoonful of water, and I never had to apply the raw material again. As my duties with sextant and theodolite brought me into more direct collision with the sun, and I did not suffer, my men soon found that the Captain's remedy was perhaps the best; and gratefully they afterwards accepted the wash as I passed it round, giving each man his strip of lint or bandage wherewith to bathe his eyes before he entered upon his delicious dreams of deer, musk-ox, hares, or ptarmigan, of which he was, as it resulted, never to taste!

May 11.—About eight we moved forward; heavy work, warm sun, and pack-ice. As we gradually neared what we imagined to be the smooth floe, we at length perceived that we had ascended considerably above the sea-level, and after moving forward about five hundred yards, crossed over the low point which we had seen from Princess Royal Island; and thus, the labour being over, very much to the satisfaction of our crew, having done a heavy day's work, "pitched" before noon. The ascent of our hill, having no weights and a chance of game, was mere amusement: but our delay here was important. The view from the summit enabled me to save hours, nay days, of conjecture; it furnished the groundwork

of weeks' labour, carried out by the knowledge of what must be the realization of the then radius of vision: it was one of those bright days which are to be made the most of in these regions, of which I was not slow in taking advantage. In compliment to one of my most respected friends, the senior naval Lord of the Admiralty, I named this Mount Parker. The few hours' delay here repaid me abundantly: I had laid in a stock of matter to guide me strictly for many days. I was enabled, by our astronomical data, to impress the indelible seal of truth on all I had done, and by that truth to be aided in fixing beyond dispute, so long as sun and latitude continued available, many other important positions from which I might merely see this! So far the surveyor is strong in his position: he can combat opposition, simply by facts and observations, which the most talented can but verify; and eventually can afford to make a long stride and overtake his poor friend the tortoise or hare, driven perhaps by impulse, but certainly not by sagacity, to despise the truths of science, to the accomplishment of unproved, and not well-searched *distance*. The delay here enabled me also to put in practice what I had some days contemplated, viz. changing the travelling hours from day to night: that is, the men enjoyed their repose or sleep during the warm temperature by day, when exposure to the sun was oppressive and withering, commencing work at six P.M., lunching at midnight, and ending at six A.M.; the sun however, although at very low altitudes, being always visible, if not veiled by clouds, etc.

On our descent from Mount Parker we noticed the

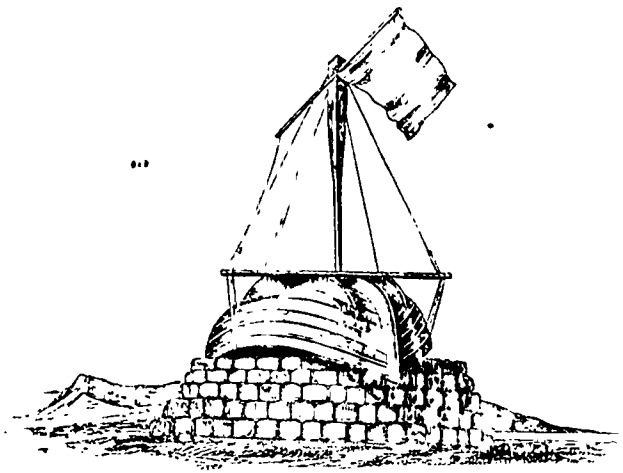
deposits of hare, ptarmigan, and fox were abundant; and following a track which I supposed might lead to their haunt, most unexpectedly stumbled upon some bones of great size projecting from the earth, which, on closer examination, proved to be the head and probably the entire skeleton of a very large whale, imbedded at a height of not less than five hundred feet above the sea. I endeavoured to detach one of the ribs, but it was too firmly frozen to yield to our picks; a portion of the head-bone was broken away and preserved.* About eight in the evening we moved forward, steering for a long, low spit, bearing east-south-east, barely visible from Mount Parker, owing to the difficulty of distinguishing any slight rise of snow-covered land; the weather also now inclined to sleet, which to us is quite as annoying as fog.

May 12.—Shortly after midnight we crossed many tracks of bears, and about five o'clock Ursa Major and Minor made their appearance, trotting down very leisurely, mistaking us, no doubt, for three fine walrus: the train was stopped, and all but the guards desired to lie down and keep close; the enemy still coming on very leisurely, but evidently not at ease, ever and anon casting her black-tipped nose aloft, looking over her shoulder, and sniffing at something not pertaining to us. *Malheureusement*, the wolf now showed himself, and just as we considered our game certain, made a feint in rear, spoiling all. Mamma was quite on the alert, and intent to save her cub: off they went at a canter. Our

* It was then charged with oil; it has since been deposited at the Royal College of Surgeons.

five dogs were slipped, and the young men of the party followed up the hunt. Gallantly did the dogs behave, the wolf acting in concert: and at a most critical moment, when Punch (our Punch) was making a determined assault on the cub, mamma put her paw on him! All was breathless suspense, for this was *our pet*. At this instant the wolf proved his superior tactics by attacking Madam in rear, when Punch was released, and escaped, not much damaged: but he was not cowed, and proved himself a fine, courageous animal. One or two ineffectual shots were fired, and the party returned, when we renewed our journey, encamping at seven A.M. on a low spit, probably a-wash, if free from ice. The loss of one of the bears was much felt, our stock of food for the dogs being now nearly gone; however, from the number of tracks, we expect soon to have more of their society. The change of travelling time entails on me the duty of watching the sun from nine A.M. until near three P.M., but does not call for any assistant; temperature at noon 44°. Before starting this evening I determined on depositing the 'Hamilton' on this point, as affording the most convenient spot for sea operations, should her services be required; and as our route now seemed to promise an almost direct journey along the land to Jones's Sound, it was not probable that we should require her aid until it became necessary to make further examination of North Cornwall in July next. Here also were deposited the return rations of five days, in iron-bound casks, for each of the two long-journey sledges, 'Londesborough' and 'Dauntless.' A very considerable pile was constructed of the surrounding frozen

turf, and above this the boat was inverted, with her mast reversed or stepped on her keel by our mode of rig, and a large blue flag hoisted to mark this as another of our fixed stations in the survey, to which the name of Hamilton depôt was given.



HAMILTON DEPÔT.

CHAPTER XI.

Inconvenient elevation.—Cape Disraeli.—Imbedded Whale.—Departure of Mr. Allard.—Determination of speed.—Strait discovered.—Progress arrested by the Pack.—Snow Crystals.—Discover open water.—Overland March.—Progress barred.—Fossil Station.—Deep Soundings.—Pack Ice.—A hollow Cairn.—Cape Disappointment.—Wellington Channel.—Apparent Graves.—Pitch Mount.—Bears.

THESE arrangements complete, at six P.M. (temp. 5°) we moved forward, intending, as the weather proved hazy, to adhere to the tidal or land-floe crack, which would securely, although circuitously, lead us to our next position; but we were again most deceitfully led into another ascent, until we suddenly discovered, through the momentary cessation of drift, that we had upon this occasion rather a steepish declivity ahead, and that we had arrived at an elevation of at least eighty feet above the level; and yet our men at the drag-belts had not discovered the increased labour due to the ascent! Until we fairly ascertained our position further progress might entail unnecessary labour, as, from the distance traversed, we computed that we could not be two hours' march from our next important station; we therefore encamped, and shortly after, on the cessation of snow, noticed, about

four miles east-south-east, the remarkable jutting headland seen from Mount Parker: our delay was fortunate, and saved much labour, and possibly the destruction of the sledges.

May 13.—At noon the weather was fine, moderately clear, and warm, with the temperature at 20°; latitude, 76° 44′ N. At eight, with a temperature of +5°, we moved forward. Our course now lay down-hill, for the nearest floe-edge (luckily a frozen swamp or pool) became available, which led us out of our dilemma by its outlet to the sea, and before midnight we were encamped at the base of the remarkable headland before noticed. Mr. Allard was now ordered to complete our two sledges to forty days each, and return to the ship, replenishing at the back depôts up to Princess Royal Island; on his return from the ship, accompanied by Dr. Lyall and his ten-men sledge, he was to bring up the whale-boat, should open water render any such step advisable. Our party ascended the mount, elevated about eight hundred feet above the sea, from whence our immediate course and future operations would be determined. This was a critical position, involving perhaps our ultimate success or failure in reaching Jones's Sound. We had now lessened our latitude to 76° 41′ 30″ N., ten miles south of the ship's position; and here we had reached an angle, dividing two lines of advance. A wide, capacious channel invited to the south, possibly turning, beyond the points in view, westerly or easterly, but clearly to my mind not a navigable sea; it might lead to Jones's Sound, but "the great object of our search" was over navigable seas, and where any party escaping would in-

fallibly leave some sign. The other course was due east, seen, it is true, by myself only, almost as a dream, but so doubtfully and indistinctly to the naked eyes of others as not quite to satisfy them; but there is no accounting for sight. Now it should be recollected that my sight was assisted by a theodolite and good telescope, through which no one else cared to look. I had seen enough to satisfy my mind. Our cairn was built, the territory duly taken possession of, and, as this sack was to be duly kept until my return, I thought it but prudent that the Chancellor of the Exchequer should seal it; it was therefore named Cape Disraeli. On our ascent two ptarmigan were fired at, but the gun was bad and I missed killing, but wounded one, which probably was enjoyed by some fox.

May 14.—On our descent we again met with another imbedded whale, and at about the same elevation. Our position at noon placed us in 76° 41′ N. and about 91° 30′ W., as yet to the west of Cape Hogarth, and only twenty-nine miles north of that position: I could not therefore afford delay here, without anything offering beyond following up land traces by this channel, nor could I venture to move further southerly; yet I felt very uneasy at leaving this strait unsearched.

At noon the sun shone out powerfully, and dispelled some of the snow-charged vapours hanging over the outline; and yet the thermometer did not rise above 15°, and only 44° in the tent. All were absorbed in deep sleep, when suddenly, in the far east, two resplendent white caps (distant, I found, thirty-six miles) revealed themselves, marking out the gates of our channel. An indescribable sensation pervaded me: I sang out, as Colum-

bus no doubt did to his friends, "Master! (Mr. Loney,) I have it." "What, Sir?" "The key of Jones's Sound." Such it proved. A snore, and all again was silence. I continued measuring base, taking angles, etc., to determine the importance of Cape Disraeli as to height, etc., which resulted in eight hundred and forty feet; but sleep I found impracticable.

About six P.M. the sledges were packed; Mr. Allard received his instructions to a particular day, then very doubtful (and not intended), when we were to meet again at Princess Royal Island: under the customary cheers, with banners displayed, we parted on opposite courses.

Our journey, through a dense and almost impracticable pack, became very difficult, rendering it necessary to double-man our sledges by spells, and eventually we emerged on the comparative smooth floe, having accomplished about half a mile in four hours. At midnight the temperature fell to $-5°$. Our wolf deserted us, returning, I believe, with Mr. Allard, who took away three dogs: a she-bear and cub, worried by a wolf, were noticed at a great distance, and avoided us.

The morning of the 15th was brilliant; we encamped at seven A.M., after a laborious day. All the distant land was enveloped in haze, and previous excitement, added to some degree of fatigue, had induced me to sleep, so that I got up too late to catch the sun at noon: I was however very content to enjoy alone and undisturbed the scenery which about that moment became unveiled, and, aided by sun and several of my well-fixed landmarks, I was enabled to prune the coast-line of any

chance errors. We breakfasted at four, this being Sunday, and at six P.M., after prayers, with a temperature of 7°, moved forward. The floe had now become uniformly smooth and clear of hummocks. Hitherto the rate of travel had been estimated, the efforts were irregular, and resting periods undetermined: this did not suit me. I travel always, for years past, with reels of the strongest cable-laid sewing-cotton, capable of sustaining fair weights —fourteen pounds: these I had measured before leaving the ship, and they were found to be very correct in length, viz. one hundred fathoms (it is marked, Patent line, two hundred yards): of this line I brought eighteen reels, equal to eighteen hundred fathoms: some had been rewound on a core, with the running part from the centre, as customary in grocers' shops, etc., which prevented any chance of undue twist. These lines were intended for sounding in great depths; and the entire loss of the line proved but a cheap mode of purchasing a valuable fact, for the failure of finding bottom in great depths is valuable information.

May 16.—Making use of one hundred fathoms and the chronometer, on the principle of the log, I was enabled to determine the period at which the sledge moved over six hundred feet of snow; the result, at very slow travelling, gave one mile in forty minutes. As this was easy work, I enacted that each spell should occupy forty minutes, and an interval for rest of ten minutes, securing a mean value of one mile in every fifty minutes of travelling; thus, in a complete day, we had, from six P.M. till midnight, six hours,—one hour for luncheon, smoking, etc., and five hours, up to six A.M., making together

eleven hours, or 13·2 miles. I considered that eight miles was a fair mean, and fifteen an excited, journey; but on the third day from quitting Cape Disraeli we had made good, notwithstanding the heavy difficulties attending our starting, thirty-six *geographic* miles.

In the first instance I thought forty minutes might be deemed a long spell, but I soon ascertained that frequently, our time-bearer being ahead picking the road, and his signal unnoticed, that fifty-six minutes or more stole away imperceptibly. Of this however I seldom failed to learn, after pitching, by some dry remark from some of the party; they always fancied they had achieved at least fifteen miles. The reflected rays of the sun between midnight and six A.M. being principally in our faces, caused much inconvenience to the eyes, and retarded the morning's work considerably.

May 17.—The latter part of our journey has been through rough and hummocky ice. About midnight we lunched near the first seal-hole we had noticed since passing Star Bluff Bath; about six A.M. we encamped on the smooth floe, but the weather was too thick to distinguish any objects but our two friends, the direction bluffs (Capes Derby and Stanley), distant about five miles south-east. The temperature had now risen to 15°.

On coming out at noon to obtain the latitude, the fog had dispersed, revealing to me a most interesting channel, inviting our entry: the main road was here clearly delineated, and studded on either side by noble, beetling cliffs, each exhibiting a similar dark belt of stratification above the line of *débris*, affording, to me at least, a nobler and more acceptable view than any vista of palaces.

In the distance, where several ranges of intrusive hummocks interfered with the observations I wished to obtain, I could perceive similar high, golden-tinted cliffs, just showing like gems above the horizon, of a bright flame-colour, but between them and the north land a clear gap showed the distant and *free* horizon. As I stood alone, all my party locked in sleep, I felt the sullen grandeur of the scene, and looked forward, with no common feeling of interest, to place the colours of our Queen on those bright specks! As to disturbing my companions, it was useless; they would soon see enough of it, and possibly might not be over-grateful for breaking in upon some pleasant dream of very different objects. Within our grasp the accomplishment at least of this *quæstio vexata* appeared, to my anxious mind, certain; everything seemed to be in our favour,—provision, men, and high spirits; I therefore went to my bag! Our latitude was to a second the same as that observed under Cape Disraeli, making our course hither, due east, thirty-six geographic miles.

May 17.—Temp. 22°. About seven P.M. we moved forward: I had a strong inclination to take the northern shore, at all events until I could gain a good elevation from whence to see my way in advance.* Strange impulse! We had reached more than mid-channel, and had lunched at the furthest limit on the floe from whence I could command the stations on each side, as well as the distant land. Here we were arrested by an impracticable, heavy, and very high pack: our only resource

* It was this station which served to fix all the distant objects easterly.



E.B. del.

Vincent Brooks Lith.

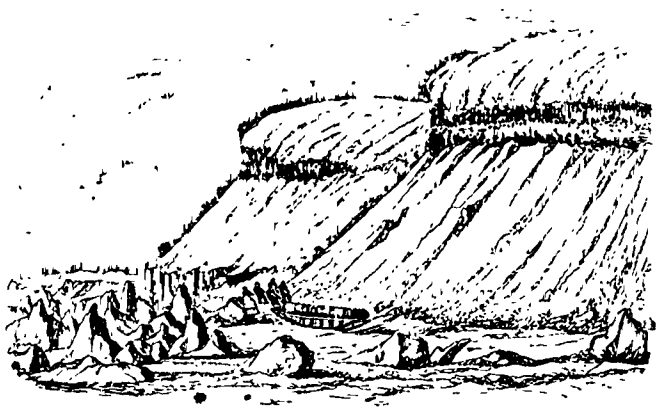
Entrance of Cardigan Strait.

was the southern side, and that scarcely afforded advance. The entire channel appeared to be pressed home with heavy pack, and suspicious withal. Water, a stranger to us for some time, might be seen in the holes; the very cliffs themselves, frowning on either side, with their dark stratified upper features, seemed calmly to deride our efforts to penetrate these mysterious recesses.

May 18.—While we delayed it began to snow. We had long joked on the different forms in which these crystallized particles fell, and had 'classed them into favourable, harmless, and unfavourable. We have to deal with the favourable, or that which, falling in large, beautifully formed crystals, in their most elaborate degree of finish, I had termed "stars and garters," from their similarity to the star of that Order, excepting that it has eight rays, whereas Nature only gives *six*. It now snowed "stars and garters." Seamen are a little superstitious. I seized this as a favourable omen, and pushed for the southern shore, landing about six, when the sun shone brightly, and we obtained our time, etc.: but it soon resumed harmless snow. I succeeded in obtaining the latitude, placing this new land in 76° 38′ 21″ north; and taking possession in due form, named our direction heads Capes Derby and Stanley, and the territory North Yorkshire. The position abounding in fossil limestone, chiefly of the Derbyshire marble, with *Entrochi*, *Terebratulæ*, etc., obtained the name of "Fossil Station." At seven P.M. we pushed forward, skirting the tidal crack: but our work was not pleasant; the evening less so, owing to a south gale brewing, which, concentrated into this pipe of the channel funnel, would perhaps

cause us to lose a day. And yet how fortunate have we been—never delayed an hour by weather! We followed our course under the base of these beetling cliffs, shooting their *débris* into the sea (when unfrozen). The strip available for travelling was at times reduced to such a very steep incline of drift snow, that we were compelled to take to the rough ice. In our march round the base of the cliffs one ptarmigan was seen, and Mr. Grove killed a small hare.

May 19.—About four A.M. our further progress was arrested by the dense and impenetrable pack up to the cliffs: off-shore it proved still more disheartening; had



it been merely ice, through which we could have cut our way, the matter would have been simply one of labour. Mr. Loney advanced to reconnoitre, but the result of his report decidedly closed further speculation: the water had made between! The glacier, abruptly broken off in advance, was *sea-washed*, and the channel exhibited unmistakable evidence of breaking up!

The only alternative remaining was to pitch our tents, and decide on making the most of our position. I was not yet quite convinced that we might not, by sacrificing a little of that precious article—time, convey one sledge overland until we met the floe again, and, leaving the 'Dauntless' party here, proceed alone with the 'Londesborough.' Thoughts and orders follow in rapid succession. Our arrangements were complete by nine P.M., and the weather having changed, the double party were in march "over the hills" in high spirits, carrying one tent, sleeping bags, and provision for five days: if any prospect of success promised, the party would return for a sledge and further provision. This was a change, a cheerful change, too, from our dilemma,—and what is not to well-disposed men?—and we had the pickings of a very fine crew, relieving some of those likely to suffer from the crew of the 'Enterprise.'

About noon we lunched on Victoria Peak, North Yorkshire, elevated about fifteen hundred feet or more above the sea, enlivened by a beautiful midnight sun, clear, and temperature 18°. But our fate was decided: not only open water from shore to shore, close up to our late encampment, prevailed, but the entire sea, easterly as well as northerly, was *navigable,* streaked only by sailing ice. But although checked for a time in this direction, from this elevation other objects for 'Hope' and 'Enterprise' discovered themselves: north-westerly new islands showed out, and afforded reason to hope, disappointed as we must feel in not placing the confirmatory cylinder on Austin's cairn, or exchanging ours for it in Jones's Sound, that we saw its commanding

headland, and had now the prospect of adding further lands to Her Majesty's Polar territories in the north-west. But we had not yet finished; the furthest available station must be reached, and the colours planted on the eastern head of this new strait.

May 20.—At seven A.M. (temp. 20°) we reached the bounding cliff, possibly fifteen hundred feet above the sea, which was named, in compliment to one of our banner ladies, Britannia Cliffs: beyond this, advance was absurd, but not impracticable for possibly three miles, but only to descend to the floe, and reascend with loss of strength, etc. I determined therefore to be content with my position, and make good my ground, preferring complete observations to any puerile attempt at enlarging my "*streak* upon paper" at the expense of want of verification (English, *truth*). We surveyors know the value of "taking time by the forelock:" that only could indelibly *establish* our furthest, as well as the position of the extreme land in sight.

Here we stood on this noble headland on the 20th of May, in a bright, warm sun, in latitude 76° 30′ 42″ north, and eastward of 90° west, with an open navigable sea below us: yes! the "Polar Sea," for aught any man knows to the contrary, beneath us; to the south-eastward several large arms, or inland rivers of some extent, penetrating, even visibly to us, deeply into the land, forming probably other islets, and connecting eventually with Jones's Strait or Sound. On this bare, bleak mountain, having obtained all that was required, I at length went to sleep, and for the first time probably disappointment and fatigue rendered my nap sound. The land on the op-

posite side of this strait was clearly an island, to which I gave the name of North Kent, and to the south-eastern conspicuous cape, Prince Edward's Cape; the remaining remarkable extremes I leave for Her Majesty's pleasure.

May 21.—After building a large stone cairn, having placed others on four different hills, and deposited the customary records, we struck our tent at nine P.M. (temp. 20°), and, retracing our steps, reached our rendezvous about three A.M.; made coffee to recruit the men, and then moved westerly to obtain a more sheltered position for repose. During our absence, a bear had been noticed sauntering about the bay, but, even with one man in charge, did not approach the tent. We were much deceived in the distance, and when we pitched, 'Dauntless' was at least two miles behind. At noon I was the only unfortunate gazing at the sun. I found here a splinter, or cortical layer, of a pine-tree, not aged. Waiting until ten P.M. for 'Dauntless,' we moved forward, reaching our old encampment at Fossil Station about 1.30, where we pitched: the weather now became cold, attended with sleet and bad-omened snow. About three the 'Dauntless' rejoined, and, the weather having improved, we ascended the commanding height near Cape Derby, in the hope of being able to make out (being fifteen miles nearer) our new islands to the north-west. The temperature was 14°, but bitter cold from the south-east, and the driving snow, just before we gained the summit, destroyed every prospect. This mountain, unlike any we have seen, is composed near its summit of grauwacke slate, of which, as it furnished noble building slabs, we constructed our cairns. On our return to the

tent we found the weather perfectly mild. Since our last visit the snow had nearly disappeared, and revealed five circles of stones, marking probably the resting-places of Esquimaux, but very old: they could never have occurred there by any freak of Nature. Our place of encampment was also a strange accumulation of fossiliferous *rounded* rocks. This position afforded us the first opportunity of determining the rates of our chronometers, which appear to have behaved well; one being my own, well tried for twenty-three years, I knew the value of, but the other belonged to Government.

At seven P.M. we moved forward against a cold, bleak, north-west breeze, and about midnight fell upon our outward track, and lunched at one of our former stations, near the seal-hole. Such an opportunity was too valuable to lose, and I here tried for soundings in the seal-hole with a two-pound lump of lead, and the cottons (to which I have already alluded): four reels rapidly vanished, but no bottom, with four hundred fathoms in the strait. The current was found to set very strong to the west (*true*).

About six A.M. on the 23rd we pitched about two miles in advance of one of our late bivouacks. The sun again lent his cheering rays, but, "after recent exposures," attended by unmistakable appearances of thaw in the strait, not unattended by the drawback that it might break up the pack before we reached Cape Disraeli, I possibly was not so grateful for his presence as I might have felt at any other period. Breaking up "the pack" and breaking up "the floe" are so widely distinct, that I think some explanation is needed; in few words, there-

fore, the floe is a homogeneous frozen mass, of possibly miles in extent, averaging from three feet to three feet six inches, or four feet, in thickness; it is tough, elastic, not easily upset, and impermeable to the sea; but the pack, being but a collection of bits of floe, or bay ice, broken into pieces of every size and in every imaginable idea of confusion, at one place two feet, at another twenty or thirty, and only cemented by casual freezing, tumbles asunder by its own inequality of weight, rending the heavier from the lighter by any slight access of temperature, or still more vigorously by cracking and letting the warmer sea—at this period never below 29·5°—flow in between the joinings. Such a body of ice is at all times suspicious; we look upon it in the light of sedition in the camp, and calculate pretty correctly that the spring will relieve us of such rubbish when we can cut through the simple three-feet ice and persuade it to float out of our way.

On the 25th, being then near to the entrance of the southern lead from Cape Disraeli, I moved towards the eastern peninsula, in order to erect a beacon, directing the 'Dauntless' to pitch on our old outward track, near the pack, and await my regaining. Our tent was pitched about a mile from the shore, at the verge of the rough ice, from whence we walked to the shore, ascending the crest of a very remarkable little peninsula, forming a deep bay within it to the southward: from hence I saw down the throat of this strait, nearly due south, but it was too hazy to obtain any satisfactory clue. Constructing a substantial rocky pile, of five feet base by eight feet four inches in height, we returned to our tent, re-

joined 'Dauntless,' and proceeded on to Cape Disraeli. Our old friend, the wolf, now rejoined, but the charm was broken; the *tabu* no longer existed: he had better keep out of range: I had lost all confidence in his "trusty" and honest intentions; he was henceforth a victim to science, if taken, and might eventually figure in one of our national museums: I find Parry did not obtain one.

About six A.M. on the 25th we took possession of our old quarters under Cape Disraeli: bears, both old and young, had been searching; but it is strange that they did not devour our fat pork, bacon rinds, etc., which were still apparent and untouched. I resolved now to search this southern channel, and therefore sent the crew of the 'Dauntless' to rebuild, on a larger scale, our upper mark on this cape: I considered it yet possible that some sharp turning easterly might again throw us into some connection with another channel leading to Jones's Strait. My own preconceived opinion, in August, 1822, relative to the vapour or apparent smoke seen from the deck, and reported from the crow's-nest "as fog rising from water behind the range of mountains," now recurred to me. It was clear to my mind that there was abundant water to produce any quantity of such vapours; and our position here being but twenty-eight miles and three-quarters north of my position on Point Hogarth, and, deducting eighteen miles for the interval of land, there was yet abundant scope for any channel taking an easterly course.

On the 26th, at seven P.M., we started on this exploration, under sail; a fresh snow-storm breeze sent us

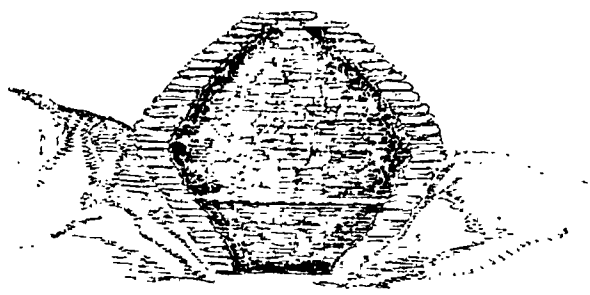
unpleasantly fast over the rough floe, endangering the sledge: it was very similar to that encountered in the creek in Northumberland Sound, in April, but the ice was less undulatory. In order therefore to avoid this, we hauled close in to the land, ranging the snow line, just within the tidal ridge, or where the land-water would leave level surfaces.

The 'Dauntless' being yet far astern, we delayed for her coming up, erecting several piles, and examined one on a hill, which had deceived us considerably. Once I became entirely cut off by a snow-storm; and being alone, and fearing the sledge might move forward and miss me, at the rapid rate it travelled, left me not very comfortable. On the 'Dauntless' rejoining and weather thickening, we pitched for the night under shelter.

At seven P.M. on the 27th, the weather having slightly improved, we moved forward, directing Mr. Grove, of the 'Dauntless,' to erect a beacon on the opposite shore. We steered for the base of a very remarkable hill, which jutted considerably into the channel, on the opposite side, where Mr. Grove had been instructed to rejoin me: having lunched there, we commenced the ascent, merely intending to place a pile on the first level. A brace of ptarmigan led me higher, one of which the gun killed, when I noticed a structure over my head which seemed to offer materials for a cairn: as I neared it I began to trace the operation of art, and a few moments sufficed to place me beside a cairn, or hollow dome, constructed by man, and evidently of comparatively recent date! This required attention: the stones were carefully removed, the minutest piece of moss or snow being searched for

any relic stowed between, which might afford some light as to its formation, or by whom. We were totally unsuccessful; it therefore only remains for me to describe its construction.

It was a double cone, being about eight feet on the axis and about the same at its greatest diameter: the rough computation at the time gave about forty courses of stone, varying from two to four inches, all parallel, selected slabs, and some appeared too heavy for any pair of our men to transport even for a few yards. These stones were not similar to those in the immediate vicinity, but were evidently obtained from a lower sandstone level; how they could have been brought up to this position was perplexing. The surrounding stones



were all of large size, and would possibly afford some, but none of the peculiar gritty sandstone of which the upper and larger tablets were composed. The internal height, excepting in the centre, was not above four feet; and the interior appeared, as each slab was removed, to have been very carefully filled in with small flat stones and moss, and yet no moss was to be found growing near it in any direction! It was *marsh moss*, and must

have been brought from below. The orifice at the apex was about three feet in diameter, and the covering-stone had been left open, by which it became partially filled with snow. The general impression was that it was of recent construction: no trace of age was visible, although every adjacent stone on the mount bore a most rugged, barren, weather-worn, and lichen-covered aspect. I would have named it Mount Desolation, but Cape Disappointment was substituted.

Every instant I expected to hear some shout of surprise; but all was mystery,—no document, European or Esquimaux. Its position was in itself curious, standing on a shoulder of the hill, commanding a view up and down the strait, and about five hundred feet above the level; the ascent also very fatiguing. I cannot imagine it to be a *cache*, for it would be mere amusement to a bear to dismantle such a structure. At one time I fancied it built for temporary shelter; but it was a work of too much time for such an object, and, situated as this was, no such idea could be entertained.

On reaching the base we were rejoined by the 'Dauntless,' and again moved forward; Mr. Grove had killed one ptarmigan. They were again despatched on a special mission to the opposite coast, whilst we continued along the western shore. Proceeding to the nearest spit point, we pitched, and fortunately killed two ptarmigan. The coast here is cut up by mountain streams (when do they run?) into all imaginable terraces and ravines, leading one to imagine that at some time this strait must be all in commotion; possibly it froze when it last was so, for the ice at present does not lead one to imagine that

it has thawed for ages!—heavy, wavy, whitish-blue ice, but partially covered with snow, and presenting more of lake than sea formation. When these rivers are set in motion by the thaws, it is not improbable that they flow over the ice and freeze immediately. The temperature on the land when thaw occurs at present I find, at three feet above the earth, to range between 20° and 24°, when at the same moment it would exhibit a temperature as low as 14° on the floe surface: the thaw therefore must result from the absorption of heat by the earth and stones alone during the day.

The latitude of this position was 76° 34′ N., and it received the appellation of Ptarmigan Station from the birds killed here, as well as being our first fresh *half-meal* obtained from our guns. The soil composing this point being a very fine sand, covered here and there with patches or tufts of saxifrage, without a trace of rock, compelled us to construct our pile of the tufts, cemented with moist snow and sand, which, freezing as we progressed, led us to hope that it might at least hold together until our next station was established.

On the 28th of May, the temperature having risen, we were incommoded by a fall of moist snow, sufficiently heavy to detain us to clear out and restow our sledge, so that we did not succeed in quitting our position until near nine, which delay enabled our consort, the 'Dauntless,' to rejoin, when we proceeded towards the southern depth of the bay, estimated as distant five miles, and not at all indicating any prospect of an opening.

If one trusted merely to appearances in this service, he would most assuredly, in many cases, be deceived;

and it is one of the unpleasant duties connected with search of the nature imposed on us, that the truth must be proved, not guessed. Forward we moved, and at midnight, enjoying a brighter sun than we had experienced for many days, halted to lunch at its eastern depth, fully believing that our journeying in this direction was at an end. During the period allowed for this meal, I ascended the hill immediately above, and there detected that two low, overlapping points, immediately beneath, concealed a narrow channel connecting another great bay, and that further progress was available at least five miles, and in the distance an extensive floe-covered sea could be traced to the horizon: that sea, I knew at once, could be no other than the Wellington Channel; and thus were we rewarded for our persisting against hope, and, I may say, strong opinion, by the discovery which was now presented.

Moving forward with much improved spirits, we soon opened out a new scene, and passing through a very narrow gorge, not exceeding an eighth of a mile in width, found ourselves within a spacious basin, extending to the south-east and south-west. The ice within the points immediately changed its character from the common smooth travelling, snow-covered floe, to the bared, undulated ice noticed generally in deep creeks, rendering our footing very insecure, and sledge-travelling troublesome. About four A.M. we reached the south-eastern angle of the basin, where a narrow tortuous channel, still affording sledge movement, appeared to connect the two seas by tidal lakes, and this very apparent by the occurrence of frequent pyramidal breaks, occasioned by the rise and fall of tide over the rocks subjacent.

During the examination of some of these irregularities on one of the upper levels, by the aid of axes, etc., the water was detected running in a pretty smart current beneath, and, on tasting, proved to be sufficiently fresh for washing purposes, thus affording to our crews a very unexpected treat: at one spot we found also pure, fresh, lively aerated water, the first we had noticed since the previous August. To explain the importance of such a discovery, it will be merely necessary to observe, that all our water obtained hitherto involved an expense of fuel, by thawing snow, and therefore it was a most precious commodity. It had been our general practice, as far as saving of fuel would permit, to warm sufficient water daily to afford some kind of ablution, more particularly to the cook, and this was found very materially to refresh and invigorate the crew, as well as to conduce to their general health. Washing and drinking therefore became the fashion at this "watering-place," and in these excesses they were suffered to indulge during our detention, much to their improvement in general health and comfort, as well as in personal appearance.

Leaving our hands thus engaged, and pitching the tents, I commenced a stroll up the mountain immediately overlooking.

It is curious at times to reflect how this habit of strolling, and without any sensation of fatigue after a hard day's travel, finds one unconsciously, and I might say injudiciously, perched high above his friends, unprepared and unarmed for offence or defence. I had in this manner reached a commanding elevation of fourteen hundred feet, affording a magnificent view of most of my well-known objects in Wellington Channel;—Cape Majendie,

Dundas and Hamilton Islands, westerly; and to the eastward Cape Hogarth and nature's own cairn were clearly defined. But I had brief time to dwell on these objects: my attention was arrested by two structures, not many yards from where I stood, and, from their outlines, exciting greater interest than the cairn noticed on Mount Discovery. These were apparently graves, and, to my senses, raised by European hands; moreover, in no single feature did they resemble anything hitherto noticed among Esquimaux. I approached, examined them, and still felt more convinced that in the present case my conjectures were well founded. My first impression was to remove the slabs, and proceed to the examination, but they were very heavy; and it occurred to me that the disturbance, as well as examination, should be undertaken by other parties present to witness the result. I therefore desisted, revolving in my mind, during my return to the tent, the discovery of the before-mentioned cairn and these two objects, and fully prepared to expect some result throwing satisfactory light on the object of our Expedition.

The direction of these structures was east and west (*true*): the length too great for the body of any Esqui-



maux, being about seven or eight feet, and three feet in width: each end was terminated by three slabs, overlying each other in gradation, and to my ideas intended

to represent head and foot stones. If one such structure had been a freak of Nature, she seldom repeats such freaks within thirty yards.

May 30.—About six P.M. the sledge crews separated; that of the 'Dauntless' to examine the outer remarkable headlands, and erect conspicuous cairns, and our own party to search these structures and the general features of the coast easterly.

After a very close examination, removing every loose stone to the foundation in the solid rock, not a vestige of anything but black dead moss was discovered, and portions of this so blackened and pressed that it was at first mistaken for human hair; however, after due examination under the microscope, and subjection to fire, its vegetable origin was clearly proved. At the very base, interspersed in the moss, numerous minute black cells, subsequently proved to be the chrysalis coverings of minute flies,* were detected,—which leads to the inference that these may have been *caches* for deer, etc.

That these formations were constructed by human hands, I have not the slightest doubt,—moreover, in all probability, by the same tribe which raised the cairn; but for what purpose remains still a matter of perplexity. If for a *cache*, what necessity for moss? for no moss or vegetable production exists on this mount, and all this is withered: beneath, near our tent, moss was very abundant. But if they abstracted their food, why cover the spots again so mysteriously?

* These larvæ and chrysalides in 1854 were discovered in peat near our winter station: they probably belong to the remains of lemmings, which resort to hollows under stones for shelter.

From these now demolished structures we constructed a very substantial cairn, seven feet in diameter by nine in height, stripping the pseudo-graves to their bases, which we found to be excavated out of the solid rock. But from whence these heavy, durable slabs were obtained still remains a mystery, as the rock composing the surface of this mount was chiefly of a loose, rubbly, fossiliferous limestone, hardly cohering sufficiently for removal in tolerably sized plates for constructing our pile, and between the laminæ abounding in *Terebratulæ*, *Entrochi*, etc. None of the supposed grave-slabs were of this very loose character, and although we visited two other stations on this same range, the stone was found to be still more rotten and rubbly,—exhibiting however columnar bits of two feet in length by about four to six inches square. Nothing at the base favoured any formation of solid stone, and the only position not examined was on the north steep incline, where it appeared to have a slaty structure; but that would require great labour to transport up at least a hundred feet of hill, and tools also to work withal. By trigonometric measurement the height of this hill, to which the name of Grave Mount was given, was found to be fourteen hundred feet, and our position at its base to be in latitude 76° 23′ north, differing but ten miles in latitude from my position on Cape Hogarth. Moving to the eastern summit of this range, which completely commanded all the features of Prince Alfred Bay, stations were taken up, which completely confined its limits, reducing it somewhat from its former dimensions. At this moment all our cairns were purposely constructed to aid in any operations hereafter

from Wellington Channel; and, curiously enough, our detention in the following August rendered them important aids in fixing our positions, whilst drifted to and fro by the moving floe.

The strait connecting the two seas received the name of Arthur's Strait, in compliment to the Prince, as well as to the Duke, his noble namesake. The range behind was named the Douro Range.

The 'Dauntless' party returned from their labours nearly about the same moment that we reached the tents, having done good service about nine miles to the west, where two more conspicuous cairns attested our right to territory on what must now be termed Prince Albert's Island.

The following day was passed much in a similar manner, with the difference of our party visiting the most conspicuous outer headland, immediately on the verge of Wellington Channel, and about nine miles from our encampment. This position enabled me, by direct reference to our cairn on Cape Hogarth, to verify all longitudes in connection with Beechey Island, and to confine Baillie, Hamilton, and Dundas Islands within limits easterly. The day proved bitter cold for handling metal instruments, and the vapour which floated in the air, although imperceptible to us, constantly impeded my operations by forming a thick incrustation of ice whenever the object-glass was exposed to the breeze; the sleet also covered the instrument with a fine sheet of filmy ice, which destroyed its motion. One deer was seen, and my coxswain (one of Sir John Richardson's land party) sent to kill it, but was unable to get within range: it

was very small, not exceeding the size of a small calf or goat, and was furnished with a pair of small, flat horns, which some of our men, not inappropriately, compared to the sails of a windmill.

This night travelling has, I find, a very peculiar effect on my constitution. I am not much addicted to sleep at any time, and obtain but little calculated to support my constitution; but on the march, generally about two A.M., or after luncheon, I am frequently seized with an unconquerable and very painful stupor, compelling me to lie down or sit on the sledge during the ten-minute halts. Today I was compelled to do so in this bitter cold; fortunately however finding an easy chair formed by Nature out of some limestone rocks, which protected me from the breeze. The doze ranges between ten and fifteen minutes, is heavy and concentrated, and seems to satisfy nature: at least I find myself relieved,—at the expense however of none during the allotted period for rest. I scarcely touch spirits for days,—never at these times,—one day's allowance (one gill) being sufficient for five or six days. I recollect one occasion, when a long exposure between Liverpool and the Ribble had exhausted me, that some kind friends noticing my head to fall at evening service, most charitably attributed it to inebriation. The truth was, that I had been all night and two days without food, and had drunk too much sea air.

The outer headland visited by us stands about one mile within the Wellington Channel waters, the interval being covered by a low, marshy belt projecting seaward, and thus forming an opposite bay to that of Prince Alfred. This fine height I named Mount Pym, after my esteemed

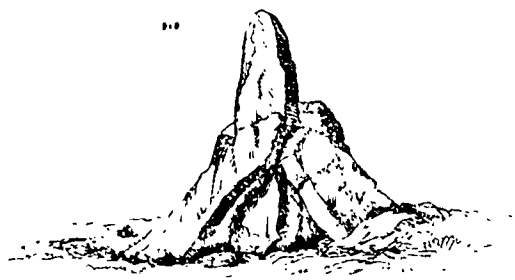
friend Admiral Sir Samuel Pym, his grandson also being my boat companion. From this height, in conjunction with Grave Mount, I plainly traced the connection of the two seas by two large lakes, with one of fresh water feeding them.*

Here I first noticed the effect of a true fog. Our temperature was 17°, with a bitter north breeze, but the air was *clear*, and objects well defined. Notwithstanding, the vapour condensed on every object; and the coldest, our heavy stone cairn, was, before we left it, a polished cone on the weather side, with the resemblance of icicles, or thaw, pendent from the under edges! Subsequently, at other stations I remarked the same. Here the ground was snow-clad, the sun had no influence at midnight, and the temperature was 15° below freezing; yet the atmosphere, northerly, was clearly "misty:" does this come from the Polar Sea?

We were naturally anxious to get back to our tent, from which our computed distance was 9.2 miles direct. We reached it in five hours and a half, slept, and about nine P.M. on the 31st commenced our return up this strait, picking up a new station at Pitch Mount, which derived its name from a very strong naphtha and asphalt effluvium, added to its swinestone formation. Mr. Grove had ascended it by another route; and informing me that he had passed a small mark, which he would not allow any of his people to disturb, I visited it in my way down. Excitement in every degree seems to pervade

* This has since been named Grinnell Land, but not by me. I deny the possibility of its being seen by any vessel from any point of the parallel of 75° 30′ north: Hamilton Island may.

this channel. On reaching the mark I found a still more perplexing puzzle than any we had yet met with. Solid and heavy structures we well know are capable of resisting the pressure of snow, wind, etc.; but here was a pile, consisting of five or six stones, constructed with such mathematical ability by the hand of man, that it was at present firm and complete, but tottering if any one stone was abstracted!



To argue against the visit of man up this channel is absurd: man built this cairn; all these objects lie in his direct path, and he selected heights. As to the ability of the Western Esquimaux, I have many convincing specimens of their workmanship, evincing a high degree of intelligence, and a wonderful habit of adaptation of the means to their object. If these structures had been of this season, I should have imagined that Commander Pullen or Mr. M'Cormick's people had forestalled me in this channel: but the operations are, on mature reflection, too laborious for Europeans. They are the result of long delay and constant application, to serve some important purpose,—at least deemed to be so by the constructors.

Shouldering my gun, I sallied forth across the bay, prepared either for bear or ptarmigan, and visited Dauntless Pile, where, after a cool walk for some hours, investigating every rock of which it is composed,—and a fine green porphyry was amongst them,—my crew rejoined, and we moved on to sleep at Ptarmigan Station. I was not in good spirits, for a most troublesome swelling of my right cheek (carbuncle) worried me desperately. One never likes to cut oneself up, particularly in such cold weather; and had I been so disposed, could not see to do it. For my own part I attributed it to eating pemmican; others, to not eating enough: doctors disagree. At this station we had an opportunity to sleep without disturbance from the sun at noon, as it commenced blowing unpleasantly from the north-west, attended with heavy snow.

June 1.—At seven P.M. the wind fell, and with a temperature of 20° we recommenced our journey. Shortly after midnight a bear was seen coming down full trot right before the wind, the weather proving hazy withal: we all lay close, both sledges in line and duly prepared, my coxswain having one double-barrel, myself the other, and Mr. Grove behind with his rifle. Bears are very humorous, and even funny, in their way. Suddenly he seemed to think he had left something behind, or he had mistaken his objects; possibly he deemed that we were too large for seals, and making an awkward bow, as I thought, within forty yards, was on the retreat: five barrels were discharged, dogs set on, and the hunt commenced. I remained by the sledges, leaving the younger ones to tire themselves, and quietly measured the dis-

tance to where he was, when I fired: this I found, to my surprise, to be one hundred and forty-six yards. Still, if the guns had been good, our game would have been secured, the dogs fed, and we should have saved very valuable fuel. The party returned unsuccessful. Punch alone would not give up;* his tongue was heard long after; and when it ceased, I felt very much afraid that he would tire himself and become an easy victim: but bears will run, and are not very anxious to face a dog.

We pushed on for Tongue Point, and there pitched. More bears! I was busy on the Point with the instrument, watching for an object, when I noticed a lady and her cub, amusing themselves, as I imagined, at a game of romps, but the old lady was evidently the more excited. Possibly no such opportunity has before been afforded to any naturalist of witnessing quietly the humours or habits of these animals. At first the motions of the mother appeared to me as ridiculously absurd, or as if she was teaching her cub to perform a summerset, or something nearly approaching it: but the cub evinced no interest, no participation in the sport—indeed moved off and lay down, apparently to sleep. The antics too of the mother were too distant from the cub to prove instructive. I will endeavour to convey my impression of the exhibition, as viewed through the telescope, at a distance of a quarter of a mile, as well as the object on which she appeared intent. It must first be borne in mind that a bear of such dimensions as that before me would weigh about six and a half or seven hundred-

* Punch is one of the Cape York dogs, now at the Zoological Gardens: the bravest of his species.

weight. The object apparently in view was to break a hole in the ice. In order to effect this, the claws were first put into requisition, and, as nimbly and gracefully as a dog, did the huge creature tear up and scatter snow and ice to the winds: having removed, as she imagined, sufficient, she then appeared to estimate her distance, calculate on her leap, and in the effort came down *perpendicular* on her fore-paws over the spot which she had scratched. Something, she imagined, had been effected. She continued to repeat this scratching and amusing mode of pounding until at length she appeared satisfied, when she assumed an attitude of "dead point," with fore-paw raised, and remained for some time immovable. The question occurred to me, "Is this a mode, by concussion and making a hole, of seducing a seal within gripe?" for I have repeatedly noticed that when we cut for tide-pole, fire-hole, etc., that these inquisitive animals will show themselves. This, however, I leave for others to verify. We now proceed to other business. Punch had rejoined: Mr. Loney and one or two of the party, attended by the dogs, endeavoured to get within shot: but Punch, poor fellow, was done up, and could not be brought to the scratch. The cub evidently had sealed orders to open somewhere south-west: she bore up. Mamma steered away south-east, and parted company, apparently after the former bear, possibly her husband, and our party returned to pemmican and sleep. The experience we have had of bears' habits fully warrants the impression that they are afraid of man, dog, or wolf, singly,—and would inevitably run from them if escape was available; but cases may occur where, finding themselves suddenly and

unexpectedly confronted, they are driven to desperation, and endeavour to show fight. All animals at bay are dangerous. The Polar bear is cunning and inquisitive, and having discovered your power, very wisely declines the combat.

About noon the heat in the tent became very oppressive, the internal thermometer exhibiting 80°, when that outside stood at 30°; the heat, nevertheless, exposed to sun, was biting. At six A.M. the face of this sloping point was encased by an entire sheet of ice, scarcely affording standing ground, and compelling me to resort to the aid of a boarding pike for safety: at six P.M. thaw had entirely denuded the point, rendering it unpleasantly soft and yielding. This uncovered the skeleton of another whale imbedded in the soil, about eighty feet above the mean level.

About six P.M., with a favourable wind aiding, we again pushed forward, reaching about midnight the skirting belt of Cape Disraeli, and, as time was precious, taking two of the party, I took the mount "by the horns," obtained the requisite observations, rejoining the division about the time they reached our old encampment. We experienced a bitter cold wind on the summit, and a repetition of the freezing fog alluded to at Cape Pym. The result however repaid the exertion, and spared a special ascent during the proper time for rest. I had become very anxious during the late high temperatures about the "north water," fearing that if it made, we might be impeded in our contemplated expedition to the new islands seen in the northern horizon.

At this station a flight of brent-geese, an owl, several

plover, and a few snow-buntings, were noticed; and the snow having disappeared from the lower slopes, revealed a pretty fair collection of vegetable life, affording tolerable feed for deer or musk-oxen, none of which however delighted our expectant eyes.

CHAPTER XII.

Hamilton Depôt.—Mount Parker.—Patches of Water.—Musk-oxen.—Dr. Lyall and Mr. Allard rejoin.—Preparations for search Northwards.—Lost Dog.—Freaks of Refraction.—Western Island.—Effect of Sun's Heat.—Buckingham Island.—Seal-holes.—Bear-hunt.—Recovery of Sledge.—Watercourses.—Rounded Pebbles.—Surface Disturbances.—Cape Ogle.—Water-fowl.—Lemmings.—Star Bluff.—Return to the Ship.

June 3.—This being our third visit to this station, it afforded a good rating position for the chronometers, and served to secure all our operations easterly: it had also the advantage of being further tested by a complete chain of triangulation, carried through Arthur's Strait and into connection with our first position at Cape Hogarth. Quitting this about 6.30 P.M., we pushed forward towards the Hamilton Depôt, in order to pick up the boat and rejoin our reinforcement at Princess Royal Island. About midnight we reached the boat, lunched, took out our provision and boat, rebuilt the pile, and moved forward, clogged a little by the additional labour required for the 'Hamilton,' but succeeded notwithstanding in gaining our old quarters, under Cape Parker, by seven A.M. This distance, from the fact of knowing the best road, and being altogether in better travelling disci-

pline, was now accomplished in twelve hours; the outward journey occupied thirty-six hours, or three travelling days! A bear came boldly down upon us, and probably would have afforded us fuel and dog's-meat; but, fortunately for him, my coxswain, when last in chase of the old lady and her cub, had loaded with snow before the powder, which was now found useless, and further entailed great difficulty and delay in discharging, reloading, etc., independent of crippling the ramrod. Bruin made off very leisurely, yet still continued to evince considerable curiosity. Three of our party volunteered to accompany him, but he was very suspicious, vouchsafing them very little attention, and merely increasing his pace from time to time to preserve a dignified distance, which having attained, he leisurely turned round to scan his impertinent intruders. As our affairs did not admit of delay, we were soon *en route*: on crossing the flats, now barely skinned with dirty ice, we noticed fragments of coal, chert, shells, etc., which had been washed up probably last season.

About seven P.M. on the 4th, the 'Dauntless' and the 'Hamilton' were despatched in advance, our party ascending the mount, in order to obtain, if possible, the bearing, as well as the best route through the off-lying pack to our new islands. From the summit they were barely seen, but I had a very clear view of the eastern boundary of North Cornwall, confirming my idea of its being an island; no land intervened between it and the capped hills of our northern group. Even to have seen them was satisfactory, for those who did not view them through the instrument deemed them imaginary. In

the north-west direction the sea presented several large pools and lanes leading towards Table Island and westerly; but this was more especially evident in those localities where I knew the tide to prevail with peculiar force. Several snow-buntings and two plovers were noticed. One or two lumps of inferior coal, jutting out of the general *débris* of mud and limestone; one rocky clump of clay ironstone, much broken up by frost into large rhomboidal masses, and some few pieces of selenite were picked up. One would almost imagine that this particular mineral had the value of gold; it was secreted by the finders, and obtained a variety of names,—that most prevalent was mica or talc. Shortly after midnight we moved forward to rejoin the 'Dauntless,' which, although hampered by the boat, had gained greatly in advance. The sun was oppressive, and as our men were much fagged, we pitched, at the usual hour, about halfway between Cape Parker and Princess Royal Island, and one mile from the 'Dauntless.' Shortly before noon, whilst engaged in taking my customary round of angles, I noticed three dark objects in the field of the telescope, and that they were in motion on the side of a hill: it was very soon evident that they were musk-oxen, the first clear proof which we had of their existing on this side of the Queen's Channel. I also noticed on the inner end of Princess Royal Island a cairn and staff, by which I felt assured that our relief party had arrived, and, curiously enough, to the very day I appointed, although I did not intend to meet them when I parted with Mr. Allard.

On the 5th, about eight P.M., we moved forward for the island; the weather hazy and unpromising. Shortly

before eleven we noticed a flag on the south beacon, and a party was discovered advancing to meet us from that direction. A little before midnight I had the pleasure of shaking hands with Dr. Lyall and Mr. Allard. They had reached the rendezvous, according to arrangement, the night before, bringing the latest intelligence from Commander Richards, as well as the missing despatches, which were found on the second attempt (accompanied by Dr. Lyall) just where they should have been on the first visit, had proper vigilance been observed.

After luncheon we moved forward to the north end of the island, where the other sledges were directed to assemble, bringing up the depôt. Time being now a valuable commodity, I ascended the peak of the island, and fortunately obtained the most important stations: I also saw our new islands, and thus I imagined all doubt was silenced. A much increased cairn was erected, and we returned to our tents.

The so-termed "despatches" did not contain one line from the Admiralty; they were simply service letters or official returns from Commander Pullen. By this conveyance I received details of Commander Inglefield's proceedings and discoveries in the 'Isabel,' at Whale, Smith, and Jones's Sounds, and I now regretted that he had not been able to obtain one satisfactory line to my eastern headland from that side; but the cheering intelligence that the Squadron generally were all supposed to be pursuing satisfactorily, and without obstruction, their several allotted duties, was matter of congratulation: so far all well. Next, my despatches from Commander Richards were very satisfactory; the rendezvous, differ-

ing only a few miles in latitude, had been visited, but no accounts of Captain Kellett or his division. Mr. Herbert, the last detached officer from Commander Richards, had returned, reporting, "All well, doing well, and in high spirits; Lieutenant May yet expected."

The wind had now set in strong from the northward and westward, attended by thick weather and snow. About two A.M. the relief party rejoined, bringing up the depôt from the southern shore.

June 7.—I had now made my arrangements to proceed with the 'Hamilton,' accompanied by the 'Lady Franklin,' Dr. Lyall, with fifteen days' provision, to the islands, and to send the sledge and tent, with remaining provisions (fifteen days'), to the mainland, inside of the island. The 'Enterprise' and 'Dauntless,' taking up all *caches*, were to remove them, depositing at Star Bluff five days', at Depôt Bay five days', and Village Point five days', and bearing additional orders to the Commanding Officer at the ship to send Mr. Pym with the light whaleboat, already fitted under my own inspection as an iceboat, to be in readiness to aid should the water make from Village Point.

At first I had intended to go alone, but I soon perceived that the crew could not drag thirty days' provision in the boat alone, added to instruments and other heavy requisites. It was fortunate that I changed my purpose in time; a few hours later would have entailed greater labour than we alone could have mastered. Our numbers now amounted to eighteen men and officers, with seventeen days' provision. Two men were sent back with instructions "that 'Dauntless' crew were to await

my return, and guard the tent." This was mistaken, failed; and we lost thereby, in all probability, the musk-oxen and other game. The York bitch, supposed to have been murdered by some bear or wolf, after *twenty-two days' absence*, rejoining in apparent good condition, was sent back with these men.*

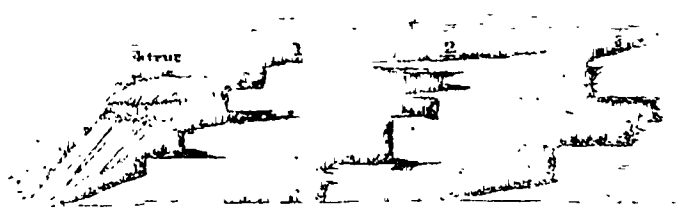
June 8.—The rough pack ice presented serious and tiresome difficulties, and the occasional appearance of water, into which our men frequently put their boots knee-deep (without injury or wet), damped, I fear, for a time, the ardour of some of our new hands; but the old party knew as well as I did that we should soon find the old floe, over which we had travelled safely, at no great distance. Many random shots were fired, none told; the "flying islands," "water making," and other such hints, all passed by harmless; my determination was not easily set aside; on we went in silence, but tongues were loosened as we reached the solid smooth floe. Countenances varied as the weather improved: what wonders the sun effects, even in these climes!

On the 9th, the outlines of the northern land began to make clearly, indeed to loom large; our principal difficulties had been surmounted or ceased; the ice was firm, the floe smooth, and no trace of open water could be discovered. Bear-tracks had become rare, and Punch, poor animal, driven almost to desperation by hunger, having had nothing lately but the scraps of the party to subsist upon, robbed the chest of four pounds of pem-

* This is a most remarkable event: it was half-starved when it left us, and how it sustained itself for this long period is quite unaccountable.

mican. As far as my own feelings were concerned, right glad was I to hear of it, as it enabled me, without murmur, to make it good; my allowance was stopped until the deficiency was covered. It was undoubtedly my province to order the proper allowance for the dogs; but I was well aware that, under the possible privation which might attend our adventure, the allotment of pemmican would be viewed with great jealousy by some of our party; and yet, if these poor animals did not work, to lighten their labour abundant whip was bestowed by these same *pseudo-feeling* bipeds! Snow, but not auspicious, continued to fall, and the barber within the tent troublesome: several of the men also were affected by weakness of the eyes or partial snow-blindness, doubtless the result of the late prevailing easterly wind.

About two A.M. on the 10th of June, the weather clearing, discovered to us the land, very distinct, but at times so distorted by the play of refraction as hardly to preserve the same features beyond a few minutes; or, once having caught the true image, wandering into every



imaginable phantasm fancy might suggest. Such were four diagrams, as here given, No. 4 being the final or true appearance of the object.

About nine A.M., the vapours having been greatly dispelled, I contrived, by close watching until near two P.M., reading the same object perhaps five or six times, to realize a set of angles. No one but a surveyor can possibly comprehend such labour; possibly many would not, but take their legal allowance of sleep, much more refreshing to the animal; to myself it was no loss, indeed I could enjoy with more satisfaction the small quantity requisite to sustain me, which, as a maximum, may be concentrated into two hours, and very fortunate do I deem myself when such a luxury can be obtained. Our noon latitude was 77° 2′ N.; forty-eight hours will, I trust, enable us to plant the Union on the *terra incognita* of this new region.

Shortly after two P.M. I underwent the wriggling action of contracting myself horizontally into my chrysalis case; the attempt in a free tent may not be so difficult, but confined to a space of two feet, and fearing to disturb others, it exhausts one's energies, and is followed by a sensation of faintness. My own bag had been altered, to suit my restless habits; the aperture being "a shark's mouth," eighteen inches from the head, the upper portion constituting a complete hood, protecting the crown of the head from side-wind or drippings: by merely closing the mouth of the bag it became a complete envelope.

About five P.M. the word "chocolate" turned up many disappointed faces, so fond are mankind of that intoxicating passion—sleep; yet the law, "Out and pack before you breakfast," requires the rolling up of beds and a clean sweep for a comfortable meal. I was myself rather

inclined to sleep, but law-makers must set a good example.

Two islands, equidistant,—one northerly, the other westerly,—presented for selection; anxious however to obtain further intelligence, if possible, of the boundary of North Cornwall, I decided to push for the western, suspecting, from a very deceitful haze which prevailed, that open water, or moist floe, which was worse, intervened between us and that to the northward.

On the evening of the 11th we pushed on westerly, in high spirits, until reaching a heavy ridge of hummocks, which at first sight seemed to offer serious obstruction; but its outline having been overcome, revealed merely the result of a severe nip, beyond which the smooth floe again prevailed.

About seven A.M. we pitched, with the sun bright, very oppressive, and biting severely, the temperature in the shade being from 22° to 28°; the natural result was that all our objects were shrouded in misty vapour, tantalizing us by the vision of the bases only of points, bays, etc. Our latitude was 77° 8′ N. At 6.30 we advanced towards our island, at that time the only object visible, hoping to reach it before midnight; in this however we were disappointed by the obstruction offered by the belt of island pack, which delayed us until two A.M., when we pitched on *terra firma* and hoisted the Union. Possession being taken, we lunched, and commenced the ascent of the nearest elevation, and there established the instruments.

Before proceeding further it may be as well to describe this "belt of island pack," for clearly it can only result

from the great floe having a tidal motion backward and forward, easterly and westerly, at a time when the temperature admits of the broken floe remaining afloat as loose pack. At the period of our visit all was firmly frozen, and no continuation beyond the outer circle seemed to afford proof of any but the action which I have described. The ice here did not seem to have been forced with so much violence on the land as in the vicinity of Exmouth Island.

At the time we commenced our ascent of the hill, which was about two hundred feet above the level, the temperature was low, 28°, with a cool refreshing air; the soil was well frozen and firm, and the summit land covered with a slight crust of snow. The island is belted, from the first base of this elevated range, by a low marshy slope of frozen mud thickly covered with tufts of grass. This mud is the result of the *débris* during the summer thaw, which appears to lose itself in the sea, distant from the elevated land about a quarter of a mile. The solid elevated land is deeply channelled into ravines, presenting, on some of the sides, vertical dark-coloured masses of rock, probably, from the general distribution of fragments which I examined, of clay ironstone. The interior presents smooth, rounded hills, deeply clothed with snow, and rising to between seven and eight hundred feet, but very difficult of access by reason of the snow in the intervening ravines.

On the lower skirting we noticed the tracks, as well as recent deposits, of deer, hares, and ptarmigan; and as we ascended the elevation, antlers and other marks of recent animal presence increased. One antler still exhibited its

skin covering, partly adhering: and from its perfume on exposure to the sun at this early date, must have belonged to a recent visitor.

Dr. Lyall found amusement in shooting at plover, brent-geese, and ducks, on the low belt, at least until supper-time. But having taken my station on the hill, I was in no humour to descend until my work was complete, and that would detain me until two P.M. at least. As the men must have rest, a watch was established until that hour; the little food that I required, being sent up when occasion offered. However, two of my guards wished for exploration, and it being their watch I released them. They ascended the highest snow-clad mount, and as they explained themselves on their return, much fatigued, "Deepish; not fit for you, Sir!" I was satisfied. On the highest mound they constructed a mark with antlers, and returned with the one alluded to, evidently dropped this year. From their account of the land seen westerly, I had already viewed the extremes of that group from positions on the floe. At the time we commenced operations here the soil was well frozen: and into that state, water exposed a few minutes would also be reduced. The ground betrayed no symptom of weakness: it was partially snow-clad. But as the power of the sun increased towards noon, the snow about me disappeared, the instrument legs sank deeper into the soil, the levels shifted and frequently required adjustment; yet still the temperature, as exhibited by a thermometer protected from sun, and hanging to the tripod of the instrument, sometimes behind our earth-pile, simply indicated 25°, or 7° below freezing. As noon passed,

the soil in all the hollows or small watercourses became semi-fluid, and very uncomfortable to walk on, or sink into. At the edge of the southern bank, the mud could be seen actually *flowing*; reminding one more of an asphalt bank in a tropical region than our position in 77° 10′ N., and, when a mist too deeply enshrouded the sun, attended with anything but pleasurable feelings. The entire aspect of our immediate position, and beneath, presented the features of a newly-drained lake, the lower land conveying its fluid mud to the sea. The soil, a dark brown ferruginous clay, resulting from the disintegration of clay ironstone, black and glazed by exposure to the sun, and cracking into compartments, impressed on my mind the probability that a continued series of hot days would materially change the outlines of my present position, converting it possibly into a similar slope to that now exhibited beneath. Even where I stood, the temperature, basking in the sun's rays, was *biting* at 25°,—with the sun clouded, chilling: but I am informed by those who were in the tent, that the heat was almost insupportable! As to my surveying observations, which confined me to the spot, they have been before alluded to; but at this position I experienced infinite annoyance from the incessant derangement of the levels, rendering repeated adjustment imperative.

How these islands were originally produced, I leave theorists to determine: how they are changed, and changing, requires no great reasoning powers. About two P.M. I was not at all sorry to commence our descent, but we experienced very dirty work before this was effected. The entire slope, in consequence of the thaw,

had become a fluid moving *chute* of *débris* for at least one foot in depth, and the attempt which we made on the steep part was highly dangerous, particularly to the men who carried the instruments. Retreat was impossible, and our only chance was to put forward our whole efforts and reach the flat. Heartily thankful were we to regain the tent, for smothering in mud was an inglorious mode of exit. I have continued the use of the term "tent,"—but the 'Hamilton' served this purpose; and as she was always dry and warm, at this season particularly, she was invaluable.

The island received the name of Buckingham, and the mount Windsor,—after the royal palaces: the entire group was called the Victoria Archipelago.

One circumstance connected with these islands still continued to puzzle me. I could not but think it strange that as the outlines of these islands were clearly and distinctly defined from several of our stations, on mountains of fifteen hundred feet elevation, that these same eminences were now entirely hidden, notwithstanding they were searched for in the computed direction with good and powerful instruments. The summits only of these islands were seen from Princess Royal Island, from whence they appeared but as dots on the horizon. Further reflection on these matters clearly convinced me that, from height to height, objects of one thousand feet elevation could not be *satisfactorily* seen at a greater distance than forty miles. From Mount Victoria every feature of this group was distinctly visible, and strongly impressed on my mind,—never to be erased. Each point, bluff, etc., was duly registered; and when, at a later pe-

riod, the "Cloud Islands" were occasionally hinted at, I must confess I was surprised; but as no one at that period ventured or wished to look through the telescope, the vision was not to them revealed.

The fatigue on this occasion prepared me for sleep, and for obvious reasons I was not disturbed until I was ready for chocolate, a term very significant in military life: indeed I believe that by general consent it was deemed convenient to make the most of this delay. About eight P.M. we struck our tent, and extricated ourselves from the surrounding pack, bidding an eternal adieu to this interesting group. Our last floe station, previous to landing on this island, had been marked by a large snow pyramid, surmounted by a blue flag: towards this our course was directed, and on reaching it we pitched for the day. At noon, although the thermometer in the shade showed 34°, and it was dead calm, the heat was oppressive to our feelings, but not the slightest action could be detected on the floe: the only change noticed was that the covering snow, instead of exhibiting a flocculent light character, was found to consist of minute, spherical, transparent globules, like fine hail. At this time probably the floe was undergoing the internal change which renders it "rotten;" and the vapour resulting assists, with the sun's rays, in converting the snow into the globules described. One circumstance was frequently remarked,—that the soft, heavy-travelling snow of the day generally changed after six P.M., when the temperature fell, to a compact solid bed; sustaining in a more satisfactory degree the men and sledges, affording a firmer footing, and very considerably facilitating travel.

Such is my own view of the matter. This reduction of the snow was, after I detected the varieties, taken advantage of to facilitate cooking, as the heavy globular variety was found to produce water in less time and save fuel.

Although the tracks of bears did not frequently occur on this off-shore excursion, still they were noticed in the immediate vicinity of Buckingham Island. The absence of seal-holes, and the general denseness of the ice, may account for their scarcity: and this leads to the question, How do these latter animals bore or keep open the holes in the ice? I am aware that Nature, even during periods of very low temperature, will keep open certain vents or escapes; and although frequently skinned over, they are soon removed by the first glances of returning sun, or by warm currents of water beneath. In seal-holes however there is generally a conical, funnel-shaped opening beneath, evincing some power possessed by this animal in thawing the ice. In February they come up to bask and pup, even when a few minutes might cut off retreat: and although it is generally maintained that bears are constantly found where seals abound, such has not been borne out by our experience,—rather the reverse.

In order to secure our retreat, I determined to recover our track over the old floe of May, and follow it up to Cape Disraeli or Mount Parker: this would carry us clear of all difficulties.

On the 14th, having recognized our old landmarks, we soon recovered our former track along-shore, and about six A.M. pitched within six hours of our destination. As nothing important called for my presence, and the sun

did not lend his cheering countenance,—suffering also from troublesome plagues (carbuncles) on my head, which weakened me considerably, I was too glad to snatch any repose; and this time Nature helped me—I really slept. When I did turn out, it was not attended by the bustle and hurry of tent arrangements: the boat was my cradle, my special cabin; and there was no necessity for disturbance. I kept my own room in order. As we neared the land, we were anxiously looking out for some signal from the 'Dauntless;' but no sign of tent or signal could be traced; I therefore imagined Mr. Grove to be revelling in the slaughter of musk-oxen, deer, or ptarmigan, and in any direction but where we were looking for him. At six P.M. we pitched on the outer edge of the inner pack line. About eight P.M. we were again in motion, and before midnight well in upon the land-ice, or that barely sheathing the frozen mud-banks beneath, but now rapidly decaying, by the discolorization enabling the sun's rays to act vigorously. The tracks of bear were again becoming common. At midnight we halted for luncheon: still no sign; possibly he had again turned *night* into *night*, and was asleep. Onward we pushed, with the Union flying—Grove's recall (he was at the ship!), and at length pitched, at two A.M., on our old position at Princess Royal Island. The features of the land were much changed by the denudation of snow. Dr. Lyall, who made a direct cut, not deviating as we did, saw and fired at a large bear,—probably, from the size of the foot, a male. He must have passed very near to our sledge, but was not noticed, nor did we even hear the report of the gun. On Dr. Lyall rejoining us,

we discovered his friend gradually working a traverse towards us, but evidently very shy: at length we determined to try and circumvent him by ambush, taking advantage, Indian fashion, of every hummock intervening, to steal upon him. Presently I became tired, and as he had caught a glimpse of me, and exhibited a disposition to bolt, I tried my distance with a ball: he whistled in his peculiar way, as much as to say, "This is not pleasant,"—a sort of twinge of the gout, etc. Punch was now loosed, and closed in the most scientific manner, keeping him at bay in admirable style. Bruin was not quite in command of his limbs,—wounded probably by the doctor and touched up by me; he began to think of intrenching himself, and, finding a convenient hummock, albeit at an angle above 45°, backed up: thus enabling him to keep Punch completely in front, and prevent any annoyance in rear, but occasionally casting a very suspicious look over his shoulder, and, I suspect, detected Lyall or myself getting too near. I was within shot, and waited only for a clear view of him, when he backed to the summit and clearly saw me. He also was evidently up to our tactics: bolting down, and keeping the hummock between us, was far away before I was able to regain sight of him. Punch followed, giving tongue enough to frighten all the bears in this region. We retreated, and right glad was I to get back; these excursions, after ten hours' travel, take the courage down amazingly. Punch made the circuit of the island, coming in quite as much refreshed as if he had stolen another mass of pemmican. Fine gentlemanly breed, those Cape York dogs!—proud as Lucifer. Our place of encampment exhibited traces of three bears,—male, female,

and cub,—who had very inquisitively searched the premises. It is probable, if we had been less offensive and taken the matter quietly, that they might have revisited us today. Punch got half my supper, to make up for his disappointment.

June 15.—The day turned out gloomy: no sun at noon, with temperature at 28°, by which we lose this as a rating position, now however unimportant. As no signs of Grove could as yet be traced, at six P.M. the sledges were ordered to meet me on the south side of the island, and, taking two men to carry instruments, I travelled over the summit, which commanded a more extensive view. Independent of Mr. Grove, I began to feel some alarm at the non-appearance of the two men despatched, as well as for our provision; but on one point I felt assured, as by my orders left with Mr. Allard he would be detained, "to await the return of Dr. Lyall." The temperature rose to 36°, moist, and thawing rapidly, yet the cold was more sensibly felt: the near floe exhibited a rent eighteen inches wide, and the water rose in the fissure within nine inches of the upper surface of the ice; any move therefore must carry all this ice off-shore.

June 16.—On reaching the island crest I perceived a tent pitched on the opposite shore, and two men, one of whom was in the act of crossing to our sledges. On regaining the boat I received a note from Mr. Allard; he had misconceived my orders entirely,—taken Mr. Grove to the ship, leaving the two men in charge of spirits, a gun, and ammunition, and who could be surprised?—one had escaped unhurt by the bursting of the Hudson Bay gun! Independent of my written orders, *finally* allotting Mr. Grove to this duty, Mr. Loney had verbally ex-

plained it to the leading man, the ship's cook: however, on we pushed for the tents, packed, and departed. It was a great disappointment, as I had intended sending Dr. Lyall and Mr. Grove up the Great Valley, between this and Wall Bluff, where I intended remaining, or possibly moving on to Star Bluff: they would have enjoyed the opportunity of good sport, and probably have met with herds of musk-oxen, which we were now satisfied were not scarce here, as these men noticed three, and probably they would have been taken had any sensible person been present; however, all was now deranged, and it only remained for us to make good the positions lying in our homeward route. Before reaching the depôt (laid out by Mr. Loney in April) we noticed two deer, but they proved too wary for our eager sportsmen.

Shortly after midnight on the 18th we encamped at the Station. Mr. Allard had left a note, by which I learned that he only quitted on the 13th. The weather clearing off and a bright sun aiding, I ascended the high land in rear, expecting to obtain a great range; but the haze resulting from heat destroyed my hopes, and I returned unsuccessful. I waited for the sun at noon, but as it did not seem inclined to show out, I strolled along the land in search of fossils, which were very abundant, especially one or two varieties of madreporite, which were here strewed in patches as if they had formed a submarine garden! Beyond, to seaward, the open spaces of water were pretty well stocked with eider-duck and brent-geese, which occasionally flew close over our heads; but, with the miserable fowling-pieces we had, killing was an achievement rarely awarded to our exertions.

About 6.15 on the 18th of June we continued our journey, which, from the rotten state of the ice, was confined to the coast-line or across the gravel spits or ledges, now denuded of snow and ice, and which appeared at a former period to have barred the mouth of some great estuary within, where, from our higher stations, very considerable lakes had been observed. These spits, in radii from the great embouchure of the valley or river, are rather puzzling, inasmuch as within our own observation no river force has been noticed, and I verily believe has not existed for years, or perhaps ages; indeed reason is opposed to any such fact: if any such force, as such appearances would indicate, had been in action, all the ice must have been speedily washed away. During the last season I know that, in three positions, no river force was in action up to the first week in September; I can only therefore refer these appearances to that distant epoch when perhaps the whales and other objects were deposited on elevations of five hundred feet and upwards, and other extraordinary influences were exercised throughout these regions. Whatever those disturbances were, they were not momentary. The summits of these mountain ranges were probably submerged; the subsidences or parallels bear the impress of distinct periods of particular action, spread possibly over ages, and are most beautifully defined throughout this Arctic region by similarity of action or of the successive retirement of the ocean; and it is only by referring to such stupendous movements of Nature that I can at all recognize adequate forces to denude, to gully out, and cut such vast watercourses. I do not allude to trumpery valley gushets,

running over and leaving undisturbed or unmarked the angular fragments of soft limestone, but of vast fluviatile continued agency, rolling to the seaboard masses rounded by attrition, and leaving behind the impression that here a mighty river rolled impetuous into the ocean, and now, having ceased, leaves us to wonder how these stones, even chalcedonies, rounded and polished, occur in the frozen river-beds! These are especially observable between Mount Parker and Step Mount; and in the interval of ten miles, where now scarce a rivulet can be found, I cannot but believe that a great river played its part, and left the extensive mud-flats and gravel ridges which now occupy our attention. At present it is to be doubted if the short interval of summer would even furnish a rippling brook. But we cannot stop here: rivers and gullies are not alone concerned; by their courses the water doubtless escaped, but by what cause was every mountain of these northern ranges reduced to certain parallel strata, as regards the lines of upheaving or subsidence? —for the lines of stratification themselves of the rocks (generally magnesian limestone), although presenting horizontal appearances east and west, are invariably dipping slightly, say at 5°, to the northward. Nor is it alone that these peculiar terraces strike the observer; the level surfaces of mountain summits, as well as gentle slopes, are for miles, indeed wherever visited, found to present an even surface of finely Macadamized fragments, to the senses, ploughed, harrowed, bush-harrowed, or finely swept! and, in some instances, the marks so indelibly impressed as if it had been the act of yesterday!

Another question forces itself on the mind: is it not

strange that these carcases or bones of whales should prefer elevations of eighty or five hundred feet? Why are they not in the valley bottoms? To comprehend all this, in all its apparent freshness, the mind becomes painfully engaged. There is no acting cause now, and yet we have had two fine seasons; there are no purling streams, and yet the mountain-sides are bared from snow. But as to snow, to our conception that plays but a minor part; for truly, so to speak, the hills are never "snow-clad;" the fall of a few days is dispersed in a few hours, and the last gale preceding actual winter puts an end to further heavy falls of snow, by reason of extraordinary low temperatures; it falls as ice or rime, no longer flocculent; indeed, what we generally misname snow is truly, perhaps, drift ice.

At length we are driven to ask those who would find reasons of their own for many things less intelligible, By what course of events, at what epochs, did these highly interesting appearances occur; not confined simply to the spot before us, but continuous from hence to the mouth of Lancaster Sound, and, except the off-lying islands of Exmouth, North Cornwall, and the Victoria Archipelago, etc., pervading all this northern region?

At this moment another perplexing circumstance must not be lost sight of. As yet we scarcely admit the existence of a gale: we certainly have not experienced the fierce ravages of tempests or hurricanes: we have the other extreme—intense cold and calm; these two must coexist! the breeze and intense cold, or the minimum of $-62{\cdot}5°$, have not yet been experienced. Where no rains or torrents can prevail, unless under a temperature

less than congelation, the great disturbing forces are absent; snow falls harmlessly, serving possibly as a mantle to protect the picture; frost seals it. Under such action, and with short glimpses of summer, the face of the hills today may be that to eternity: let him who is competent break the seal and enlighten us.

Under the present aspect of the coast about us, solemn indeed is the feeling as regards our missing countrymen: no hope here, so far as our experience serves, can exist for sustenance beyond the casual capture of bear or fox during six months of the season, and no means of allaying thirst but by thawing ice in the mouth until June, perhaps July, then only perhaps for six weeks.

As regards the surface disturbances throughout these regions, I am far from allowing ice to be the agent. In warmer regions masses of rock are disrupted, because water enters the crevices, is frozen, and rends them: heat drives off the ice entirely; here no such action takes place; masses of rock however are disrupted from their deep beds, and rise in confused heaps upon many rounded hills, where the pick, even in the warmest summer day, would not penetrate many inches without being opposed by a solid mass of ice and stone, defying further progress. The surface heat of some few warm hours (few and far between) would not penetrate one foot; and even admitting such a fact, for argument sake, the result would be merely adding a fresh icy covering until renewed heat entailed a similar repetition. This we experienced repeatedly during the whole summer season, rendering it difficult to dig a hole any depth; but if the simple mode of disintegration by frost be advanced,

let us inquire whether such an explanation will satisfy our scruples as to the mixture of so many ingredients, and of many never found *in situ*: will frost bring them together? I would venture to submit a few interesting questions for solution: in the first place, how did the rubble on the mountains and sides become reduced to Macadamized proportions, not affording, for hundreds of yards, one stone weighing above one pound? At what period were the skeletons of whales deposited? When did trees or vegetation flourish here? If these seas were ever open, where is the drift-wood, or why are the small pieces found of the oldest possible date? These are matters for the discussion of master minds; they afford fair grounds for reasoning, and may prove highly interesting to science.

Except at our extreme eastern position and Arthur's Strait, no trace of Esquimaux has been noticed; still I am inclined to believe that their visits to this northern region have been comparatively recent.

In our progress towards Step Bluff, three deer were noticed. Dr. Lyall, accompanied by two of our best sportsmen, attempted to creep towards them, but they proved too wary, and made off up the valley. We were now pushing for Step Bluff, the north-west angle of Prince Albert land, and the extreme discovery of last season. Several troublesome spits rendered travelling very laborious, the sharp angular stones cutting deeply into the soft iron of the runner-bands, as well as tearing out the rivets. As we neared our position, greater difficulties however assailed us; the heat had sufficient influence on the inclined dark detritus from the mountain above us to

melt the remaining portions of snow, and thus produce a belt of water within the skirting ice, which opposed great difficulty to our advance, notwithstanding our light loads and double-manning the sledges.

The travel without wading now became very difficult; and thinking I might avoid the difficulties by crossing the ravine about a hundred yards up the hill-side, I made the attempt. But I found the soil fluid, and so quick, that in my weak state it was unsafe to risk being entrapped: even the light dogs declined the effort. Ascending however until I gained the old snow, I succeeded in finding a place pretty well bridged; which enabled me to clear the remaining difficulties. If such be the condition of the coast-line in June, what must be expected in July and August? The floe was no longer safe, and a few hours might place us in the awkward dilemma of not being able to advance until it broke up. Not a day had we to spare, and therefore it was necessary to exert every effort to reach the turn of the land before the ice became detached.

June 19.—As we neared Step Bluff (now named Cape Ogle), the road improved, and about two A.M., having reached the shingle beach which fringed the coast-line, we pitched. The day was bright, the horizon clear, and all the objects we were anxious to see were clearly defined; and this being our connecting, or key station, I lost no time in gaining the summit. Indeed I had become so weak, and anxious to relieve myself from further fatigue, that I had preceded the party, hoping to terminate my labours. But I was doomed to meet with disappointment: before the instrument could be le-

velled, a dense curtain of fog capped the mountain. At intervals the bright sun dispelled the vapours in particular directions, and permitted the most important distant points to be taken. But I was not easily discouraged; and, determined to wait the pleasure of Dame Nature, made up my mind to try her humours, at least for twelve hours. Adopting a watch, I directed my meals to be sent up, and a spirit-lamp to warm tea, cocoa, etc.

From this commanding elevation (about eight hundred feet) I had a good view of the changes which had occurred. The water had made in great detached pools between us and Exmouth Island; indeed some spaces afforded sufficient area to manœuvre the Arctic Squadron. Immediately beneath the base of our cliff, and continuous to Star Bluff (about six miles), the ice had broken off abruptly from the shore ice, leaving a vertical glacier face of ten or fifteen feet, and within this only was travel practicable. The boat certainly could pass; but the launching, hauling-up, lading and unlading, rendered this mode of travel injudicious, as well as insecure: it would further cause infinite delay, and at this moment could not be risked.

In the water beneath, but preserving a very respectful distance, we noticed numerous brent-geese, eider-duck, gulls, kittiwakes, and mollymoks, which our crews were very anxious to try their luck with in the boat; but too much rotten ice intervened, and, with the heavy load of provision we were now burdened with, it was peculiarly necessary to husband strength and avoid risk.

Inland in the valley gorge between this and Depôt Station, a vast lake communication appears to penetrate

about five miles to the south-east; and from the steeply inclined sides of the mountains, a very considerable water surface must prevail. If musk-oxen, deer, or other game exist anywhere in this region, I should be greatly inclined to seek for them there, and the attempt may yet be made from the ship.

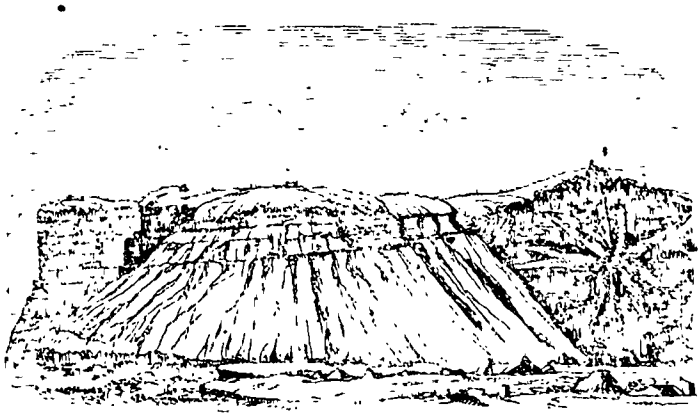
The entire formation of this headland is a fossiliferous grey limestone, with a tendency to oolite, comminuted as usual into four-ounce pieces. Whence the larger lumps were obtained to construct the cairn, I know not, unless they cleared the mountain before our arrival: Commander Richards was unable last season to find more than enough to construct his very small mark.

Making a temporary bed of the smoothest Macadamized spot, I lay down under the lee of the pile, in order to avoid the barber, or condensation and freezing of fog on eyebrows, whiskers, and beard, reducing one literally to Jack Frost, very troublesome and very painful to remove. I happened to drop into a momentary doze, when my watchman pulled me by the coat, and on opening my eyes I noticed before me, in my confused state, a fairy-like vision. About thirty yards in front of me sat, with body and ears erect and fore-paws hanging, a most interesting, inquisitive, snow-white hare. Although in some measure disposed to pity the poor creature, the cruel instinct of our nature prompted me to point my gun, and fire a ball; and this failing, shot followed; but the vision, much to our mortification, vanished. One brent-goose we had, to which this would have been an agreeable addition. But Puss, and many other specimens of Arctic zoology, may thank our bad fowling-pieces for similar escapes

from the National Museums. Events seldom occur singly: I had not moved from my soft gravel bed, having reloaded, when two other furred animals came to inquire the cause of disturbance: one literally ran into my hand, and the other was taken by my attendant. These were two fine specimens of lemming, much resembling moles. Sauntering about, I found, on the very edge of the precipice, a very large vertebra of whale, which I have since discovered to have been carried up the mount last season by some of Commander Richards's party for a mark. Descending to the beach to determine the latitude, which I found to be 77° 3′ N., I continued sauntering about this flat, examining the variety of mineral bodies and fossils here collected and freed from their matrix; not varying, however, from those of Depôt Point, excepting that the madreporites here more frequently presented the chalcedony or flinty state. On reaching the pile erected here, I remarked three other vertebræ, much larger and very different to that on the cliff, these having their projecting processes complete, and of a dark, dirty greenish colour; that noticed at the summit was much bleached. The temperature, under a very oppressive sun, ranged between 28° and 32° in the shade, the water still making, and ice off-shore in motion. About two (having maintained myself independent in the boat since the return of the tent) I endeavoured to recover some of the lost sleep, but without success; and at four P.M. commenced our lower beacon, removing or constructing a duplicate further out, in connection with the mark seen at the base of Star Bluff.

June 20.—(Six P.M., temp. 28°.) We now pushed for-

ward, and had very intricate travelling; the snow-bank observing the inclination of the *débris*, throwing all the weight on the lower runner, and imbedding it in such a manner that, with all hands and very great labour, it was difficult to make any progress. After mastering two miles of this disheartening work we again reached a flat beach, following up the tracks of our returning sledges, the 'Dauntless,' etc. The bay contained between this and Star Bluff was evidently the great outlet of some extensive lakes; possibly those before alluded to; but its course here was bounded inland for two miles at least by vertical bluffs, extending from Star Bluff, and on the north by high level terraces, swept away at their base by the force of the waters. Three distinct embouchures, with beds of rounded stones and occasional boulders, presented; but not one drop of water! About eleven



we reached the depôt on Star Bluff, not named from any propitious star, because I here took my involuntary C.B. (cold bath), and here was deposited our damaged bread,

as well as additional supplies, which we now wished at the ship. Star Bluff (now named, in compliment to my old captain, Cape Ekins) takes its name from a curious arrangement in the fracture of the cliff face, which observed a radiated form; the snow, lodging on the ledges, presented against the dark ground, elsewhere prevailing, a very perfect stellar form,* used by us for a long time, and at great distances, as a mark.

Here we found that the greater part of the provision remained, and we had therefore to overload our sledges and carry it forward. It was unpleasant, and not quite fair to our crew; but delay would make matters worse: it was therefore to be executed, even with our harassed crews; every one was disconcerted, and very dark were our faces. During this process I ascended the hill, where I had ordered a cairn to be built; possibly it was deemed too steep for younger blood: we built three, one a house, the two others were constructed by myself,—the last being on the *inaccessible* summit of True Star Bluff, —and unattended. I must say I would not have ordered it to be done by any but a volunteer.

It is needless to repeat another Step Bluff version: we pushed on, making very slow work, and pitched at a low rubbly point, about five miles in advance. We have now been fifty days engaged at this work, with fair sportsmen and three good private guns, besides two indifferent Government fowling-pieces; and two hares, five ptarmigan, one brent-goose, and several plover, not one day's provision, is our list of game taken. The race past Cape Ekins was rapid, with overfalls; the water abounded with wild-

* The woodcut is more decidedly stellar than the reality.

fowl, but that was all we benefited by this "teeming of animal life." I think it possible, had we launched the boat, that four or five ducks might have been killed; they were all very wary and strong on the wing. How ten men, dependent on their guns, could subsist, I cannot imagine; if travelling, it would be next to impossible. Walrus or bear, if the party was stationary, would afford fuel and food; and, during the season, the skins of both, aided by snow huts, might furnish a miserable shelter: the frozen skin of the walrus would be impenetrable, and the fat could be peeled off as required. How many would survive such a life I venture not to surmise.

At midnight on the 22nd we reached Depôt Bay. I was on the heights, obtaining angles, when I observed both sledges, having entered well on the floe, simultaneously turn back: there certainly was open water not far from them, but as both our return sledges could not be much in advance, and we were on their track, I hastened down, and, on reaching them, found that merely surface water had alarmed them. Having extricated the sledges, we double-manned them alternately, and soon surmounted the difficulty, occasionally sinking into the holes, where surface pools had frozen, about knee-deep; but this I knew must be expected just at this season, the true base of the floe having a thickness of at least three feet ice: no accident or truly "break in" occurred.

We now pushed forward for a low spit island, in the depth of Napier Bay, in which direction I noticed a sledge advancing under canvas: this was hauled up at the spit, and her crew advanced to aid our party. It proved to be Lieutenant Cheyne, despatched by Lieu-

tenant May, who had returned to the ship on the 13th of June, and was the bearer of intelligence from Commander Richards, who had fallen in with Lieutenant Hamilton, of the 'Resolute,' by chance, about one hundred miles west of the appointed rendezvous, to which he was then proceeding. Fortunately, Commander Richards was thus enabled to direct Lieutenant Hamilton where to overtake Lieutenant Osborn, who was also instructed to conduct him to the rendezvous. Lieutenant Osborn was further directed to forward the documents brought by Lieutenant Hamilton, by Lieutenant May, who had thus, on reaching the ship, again despatched them by fresh hands to meet me: the contents of these despatches will be treated on in the following chapter.

Leaving Mr. Cheyne to assist the other parties, after a short rest at this spit island, I pushed on for the ship, with two days' provision: on our outward journey it took three days to get thus far, but now, using the 'Hamilton' as a sledge under canvas, we reached Village Point in four hours, viz. about 9.30 P.M.

Having delayed a short time to obtain some angles, I was in the act of setting up the theodolite: an ominous jarring behind me caused me to start and leap aside with the instrument; providentially I escaped. This pile, constructed of very large stones, fell with a heavy crash on the spot I had occupied; it was twelve feet at base by ten feet high, and flat-topped, to support an instrument.

The work finished, onward we pushed, and at five P.M. on the 23rd of June, ten hours only from the time of starting, I was divesting myself, before a warm fire in my cabin, of my travelling dress.

CHAPTER XIII.

Open Water.—Despatch from Richards.—Notice left by M'Clure.—Stores covered with Snow.—Brewing.—Mustard and Cress.—Return of Richards.—Movements of Western Division.—Game killed.—Canal completed.—Cairn on Barrow Island.—Osborn rejoins.—Mount Acland.—Assistance Spit.—Visit of Pullen.—Port Refuge.

THE great surfaces of open water which I had observed to the northward, added to rumours of the appearance of a similar inclination in the vicinity of the ship, rendered me very anxious to be present, in order to superintend in person any measures which might be expedient for the relief of the southern parties, which might be expected about the 13th of July; but I was much relieved, on arriving at Village Point, to find, by the open water there, that these matters had been very much overrated, and that nearly the same area of water remained as noticed on the 2nd of May; at which date also the ice had manifested similar symptoms off the southern end of the sound, towards Spit Island.

The passage of the Queen's Channel has doubtless been in a similar condition for some time, and attended with danger; but before the period arrives for the final crossing of our party, they will be aided by open water

and their two boats. On examining the inner channel ice, it was found, in the tideway, where many holes existed, to average two feet in thickness.

The Lady Fanny Disco* was despatched (in lieu of a carrier-pigeon) to the ship, adorned with a yellow flannel necklace, within the folds of which a note to my steward was secured, directing him to make the necessary preparations for my return: this trust she faithfully executed. But her poor companion, Mr. Neptune, having been drummed out and declared by all the sledge crews as a notorious pemmican thief, had committed suicide by attempting to steal the bait of a spring-gun set for the wolf which had followed our dogs up to the ship: no one had yet succeeded in capturing one of these animals.

I now proceed to explain the nature of the despatch received from Commander Richards, and the circumstances attending his meeting with Lieutenant Hamilton. Alluding to Lieutenant Osborn he observes:—

"We parted on the evening of the 17th of May, and on the morning of the 18th, steering at the time to the north-westward, I discovered sledge tracks, apparently very recent. Halting the sledge, I proceeded with two of my crew to follow them up, and in the course of an hour came upon the encampment, which proved to be a party under Lieutenant Hamilton, twenty-one days absent from the 'Resolute;' we must have passed each other within one mile, but the thick weather, had it not been for the sledge tracks, would have prevented our meeting.

"From Lieutenant Hamilton I learned that H.M.S. Resolute and Intrepid had reached Winter Harbour,

* One of the dogs, so named by the men.

Melville Island, but finding it hampered by ice, had wintered at Dealy Island, Bridport Inlet. That Lieutenant Mecham, on his return last season from the duty of laying out the depôts, had fortunately discovered a record left by Commander M'Clure at the Sandstone Rock, in Parry's Winter Harbour, stating that H.M.S. Investigator had been blocked for three winters in the ice, at the "Harbour of Mercy," Banks Land. Captain Kellett consequently had despatched a travelling party to the 'Investigator' in the early spring, and Commander M'Clure succeeded in reaching the 'Resolute' on the 19th of April. The 'Investigator' had lost one man since entering the ice."

The following is a copy of the document left by Commander M'Clure:—

Abstract of the Proceedings of Her Britannic Majesty's Discovery Ship 'Investigator,' since parting company with the 'Herald,' upon the 31st July, 1850, off Cape Lisbourne.

August 2, 1850.—5.20 A.M., lat. 72° 1′ N., long. 166° 12′ W. Made the ice, which did not appear heavy; but upon entering it a short distance was undeceived, and ran out.

August 5.—In running along the pack edge, endeavouring to find an opening, exchanged numbers with the 'Plover,' and at 11 A.M. made a low shingle beach to the eastward of Wainwright Inlet, and at midnight rounded Point Barrow in 73 fathoms, but from the foggy state of the weather did not see it.

August 8.—1.45 A.M., being off Point Drew, sent Mr. Court, Second Master, and Mr. Miertsching, interpreter, to deposit a notice of our having passed, who met some Esquimaux that had arrived three days previous. These trade with the Russians, and were very friendly; therefore sent a letter, with the chance of its reaching the Admiralty. We also heard from them that last year three boats had passed to the eastward, with white men and Indians, which was most probably Lieutenant Pullen. In the evening erected a cairn, and buried another notice at Point Pitt.

August 9.—Passed the Colville, about forty miles from its entrance, in three fathoms and a half.

August 11.—Deposited a notice upon Jones's Island, which was thickly strewed with drift wood; in the forenoon two baidars, containing twenty-four natives, came alongside. The chief possessed a gun, with "Barnet, 1840," on the lock, obtained from the Russians. Bartered tobacco for salmon and ducks. In the afternoon communicated with another party, who were exceedingly intelligent and clean. Sent despatches for the Admiralty, *viâ* Colville, and from what the interpreter states, believe that they will arrive.

August 12.—Several baidars came alongside, received fish and ducks for presents of beads and tobacco; these are adroit pilferers. Ran upon a shoal eight miles north of Yarborough Inlet, having, during the last two days, narrowly escaped several of these dangerous banks, which are very little above the water, and hidden from view by the ice. Hove off with stream anchor, but unfortunately upset a whale-boat, and lost eleven casks of beef, having to carry sail to prevent being again set on shore.

August 15.—Found it impracticable to get two miles in any direction, the ice having closed from the northward, resting on the shoals in that direction, and to the southward on the low banks which we grounded upon yesterday. Anchored to await some favourable change.

August 16.—Ice to northward of shoals having slightly eased, leaving about a hundred and fifty yards of open water; weighed, and warped through two cables' length of ice to get into it, which occupied six hours of hard labour, so heavy was the pack.

August 17.—Noon. The weather, which had been foggy, cleared, with a breeze from the north-east, made sail through heavy sailing ice, occasionally striking violently. Navigation along this coast very dangerous, the sand-banks being low and numerous. Lat. 70° 30′ N., long. 148° 4′ W.

August 21.—Made the Pelly Islands, off the Mackenzie; since the 17th have encountered very heavy ice; ran ninety miles into a bight, which brought us to the solid pack: fortunately we were enabled to run out of it before it closed.

August 24.—Observed some huts a little to the westward of Point Warren; sent despatches for the Admiralty, with the hopes of their being forwarded by the Hudson's Bay Company. This tribe however have no traffic with them, but barter with others further west that trade with the Colville, giving as their reasons, that the Hudson's Bay

Company had given the Indians water which had killed many of them, and that they did not wish to have any; they appear savage and warlike, and are at enmity with their neighbours. Brought the despatches back.

August 30.—Observing a post erected on the beach near Point Maitland in Liverpool Bay, sent to examine it, and deposit a notice of our passing; found it was an Esquimaux' mark, who apparently had recently quitted it, there being several *caches* containing birds and fish. In the afternoon, whilst approaching Cape Bathurst, observed Esquimaux on the shore; upon communicating with them found that they belonged to a tribe now at Cape Bathurst, who were catching whales, and the same who had seen Sir John Richardson last year. In the evening, being thick, and getting into three and a half fathoms, anchored between Baillie's Island and the main.

August 31.—Proceeding to Cape Bathurst; tribe consisted of three hundred, very friendly, would go south in three weeks; gave them despatches for the Admiralty, a gun and ammunition to the chief, and many presents among them, and, judging from their cleanly appearance, have great expectation of their reaching.

September 1.—Off Cape Bathurst; many natives came on board, and being nearly calm, remained until evening, when a breeze springing up, we took our final leave of the Esquimaux on the American coast, fully convinced that neither the ships nor any of the crews of Sir John Franklin's Expedition have ever reached these shores. They appear a quiet, inoffensive people (with the exception of those at Point Warren, which the Cape Bathurst tribe have no dealings with), and would assist any white people thrown amongst them. The whole of this coast is shallow, but with the lead may be safely navigated, the soundings being very regular: the shoals terminate about thirty miles to the eastward of Yarborough Inlet, and water varying from one mile to forty in breadth may be calculated upon along shore, between the beginning of August and 10th of September, according to the winds, more or less ice encumbered; but the natives state that every year the ice opens from the shore. We found the prevailing winds from east-south-east to north-east.

September 6.—11.30 A.M.; being to the northward of Cape Parry, remarked high land from north and east to east-north-east.

September 7.—9.30 A.M., landed, and took possession of the discovery, and named it Baring Island. The land is bold upon the southern side, being upwards of one thousand feet in height, its northern being

Banks Land. Erected a signal pole with black ball, and left a notice, in lat. 71° 8′ N., long. 122° 48′ W.

September 9.—Observed land north-north-east; named it Prince Albert's Land, which is continuous with Wollaston and Victoria Land, and extends north to lat. 73° 24′ N., long. 112° 48′ W.

September 11.—Ship beset, lat. 72° 52′ N., long. 117° 3′ W., but ice in motion.

October 8.—Since the 11th of last month have been drifting in the pack; narrowly escaped destruction several times, until, with a heavy nip, at three A.M., which listed the ship 3¼°, we were firmly fixed for the space of nine months in lat. 72° 47′ N., long. 117° 34′ W.

October 10.—Took possession of Prince Albert's Land, distant four miles.

October 18.—And, today, of the Princess Royal Isles, lying in the centre of Prince of Wales Strait, distant four miles from the ship (lat. 72° 46′ N., long. 117° 44′ W.). There is erected a large cairn, pole, and ball upon its summit; and have deposited three months' provisions for sixty-six men, besides leaving a boat and some ammunition.

October 21.—The Captain, Mr. Court, and party, started to trace this Strait towards north-east.

October 26.—Discovered the entrance into Barrow Strait, in lat. 73° 30′ N., long. 114° 14′ W., which establishes the existence of a north-west passage.

October 30.—Five musk-oxen shot upon Prince Albert's Land, which terminates our operations for 1850.

April 18, 1851.—This day despatched three travelling parties to search the coast line: Lieutenant Haswell to south-east, towards Wollaston Land; Lieutenant Cresswell in direction of Banks Land; and Mr. Wynniatt, Mate, to north-east; who respectively reached the positions as noted in the margin, and traced the coast as per accompanying chart.

Captain and Mr. Miertsching, the interpreter, communicated with the Esquimaux upon Prince Albert's Land, about sixty miles south of our position, who had previously been met by Lieutenant Haswell. They traced the coast-line as marked in the chart, and state that there are many of their tribes inhabiting the land towards the south, but that they know of none to the northward; they are a kind, simple people, and have never before seen the white man, at whom they were evidently alarmed.

July 14.—Ice opened without any pressure, and the vessel was

again fairly afloat,—but so surrounded with it that we only drifted with the pack, having been able to use our sails but twice, and then only for a few hours, up to the 14th of August, when we attained our furthest northern position in Prince of Wales Strait, lat. 73° 14′ N., long. 115° 32′ 30″ W.

August 16.—Finding our passage into Barrow Strait obstructed by north-east winds, setting large masses of ice to the southward, which had drifted the ship fifteen miles in that direction during the last twelve hours, bore up to run to the southward of Baring Island.

August 20.—Lat. 74° 27′ N., long. 122° 32′ W.; have had clear water to reach thus far, running within a mile of the coast the whole distance, when our progress was impeded by the ice resting upon the shore. Secured to a large grounded floe piece in twelve fathoms; ice appears to have been but recently detached from the coast.

August 29.—Ship in great danger of being crushed or driven on shore, by the ice coming in with heavy pressure from the Polar Sea, driving her along within one hundred yards of the land for half a mile, heeling her 15°, and raising her bodily one foot eight inches, when we again became stationary, and the ice quiet.

September 10.—Ice again in motion, and ship driven from the land into the main pack, with heavy gale from south-west. Succeeded in getting clear from main pack, and secured to a large grounded floe, lat. 74° 29′ N., long. 122° 20′ W.

September 19.—Clear water along shore to eastward: cast off, and worked in that direction, with occasional obstructions and several narrow escapes from the stupendous Polar ice, until the evening of the 23rd, when we ran upon a mud-bank, having six feet under the bow and five fathoms astern; hove off without sustaining any damage.

September 24.—Daylight, observed Barrow Strait full of ice, and large masses setting into the bay; determined on making this our winter-quarters, and finding a well-sheltered spot upon the south end of the shoal upon which we last night grounded, ran in and anchored in four fathoms, lat. 74° 6′ N., long. 117° 54′ W. This night were frozen in, and have not since moved. The position is most excellent, being well protected from the heavy ice by the projection of the reef, which throws it clear of the ship six hundred yards.

The currents along the coast of the Polar Sea appear to be influenced in their direction, more or less, by the winds; but certainly on the west side of Baring Island there is a permanent set to the eastward; at one time we found it as much as two knots during a perfect calm, and

that the flood-tide sets from the westward we have ascertained beyond a doubt, as the opportunities afforded during our detention along the western shore of this island gave ample proof.

The prevailing winds along the American shore and the Prince of Wales Strait we found to be north-east, but upon this coast south-south-west to north-west. A ship stands no chance of getting to the westward by entering the Polar Sea; the water along shore being very narrow and wind contrary, and the pack impenetrable but through Prince of Wales Strait, and by keeping along the American coast I consider it practicable.

Drift-wood is in great abundance upon the east coast of Prince of Wales Strait, and on the American shore also. Much game abounds. In this vicinity the hills abound in reindeer and hare, which remain the entire winter. We have been very fortunate in procuring upwards of four thousand pounds.

The health of the crew has been and still continues excellent, without any diminution of numbers: nor have we felt the slightest trace of scurvy.

It is my intention, if possible, to return to England this season, touching at Melville Island and Port Leopold; but should we not be again heard of, in all probability we shall have been carried into the Polar pack, or to the westward of Melville Island: in either of which any attempt to send succour would only be to increase the evil, as any ship that enters the Polar pack must be inevitably crushed; therefore a depôt of provisions, or a ship at Winter Harbour, is the best and only certainty for the safety of the surviving crews.

No traces whatever have been met with, nor any information obtained from the natives, which could by any possibility lead to the supposition that Sir John Franklin's Expedition, or any of his crew, have ever reached the shores we have visited or searched; nor have we been more fortunate with respect to the 'Enterprise,' not having seen her since parting company at the Strait of Magellan on the 20th of April, 1850.

This notice was deposited by a travelling party in April, 1852, consisting of

CAPTAIN M'CLURE,
MR. COURT, *Second Master*.
JOHN CALDER, *Captain Forecastle*.
SERGEANT WOON, *R.M.*
GEORGE GIBBS, *Ab*.

GEORGE BOUNSELL, *Ab.*
JOHN DAVIS, *Ab.*
PETER THOMPSON, *Captain Foretop.*

Whoever finds this, it is requested it may be forwarded to the Secretary of the Admiralty.

Dated on board Her Britannic Majesty's Ship 'Investigator,' frozen in in the Bay of Mercy, lat. 74° 6′ *N., long.* 117° 54′ *W.— April* 12, 1852.

(Signed) ROBERT M'CLURE, *Commander.*

Unless there is a vessel now at Melville Island, it is not my intention to revisit it, but make the best of my way down the Strait.

(Signed) ROBERT M'CLURE, *Commander.*

'*Resolute*,' *Dealy Island, April* 27, 1853.

Found 'Investigator' at Bay of Mercy (having lost *one* man since entering the ice), by a travelling party from 'Resolute,' that left the ship on March 10, 1853. Captain M'Clure arrived on board this ship on April 19. Detailed accounts will be sent to Beechey Island. She has not met with any traces of missing Expedition.

H. KELLETT.

Commander Richards continues:—"I also learned from Lieutenant Hamilton that Commander M'Clintock had left the Hecla and Griper Gulf early in April, to carry out the search to the westward.

"It would therefore have been worse than useless for me, under these circumstances, to follow out my original intentions. And considering that it would be for the benefit of the service that I communicated with Captain Kellett, inasmuch as it would enable me to bring you his despatches, the latest intelligence of what had been effected by his parties, as well as the determination which had been come to as to the abandonment of the 'Investigator,' I resolved at once on this step, and to return by

the southern coast of Melville Island, and up the Byam Martin Channel. Directing Lieutenant Hamilton to the rendezvous for your despatches, and desiring him to endeavour to overtake Lieutenant Osborn, and deliver to him Commander M'Clure's journal, we parted without loss of time."

But let us now revert to the 'Assistance.' Many changes had occurred; but one idea prevailed,—that she had exchanged her snow-white bath for the semblance of a filthy farm-yard: I could barely credit my senses.

The decided action of the tides now furnished undoubted proof of the release from outward floe pressure by the increased gaping of the cracks, as well as gradual motion of the ice off shore. The thaw also materially assisted this latter action, and rendered me anxious to recover our stores, still buried beneath the snow, affording at the same time an important warning, not to be lost sight of at a future season. Had any sudden break-up of the ice occurred and carried the ship out, most assuredly a very considerable portion of the standing fittings of the ship would have been left behind, buried beneath the snow, and, as it so happened, without any soothsayer to divine in what spot. Every effort was therefore directed to the embarkation of the Observatory, boats, spars, etc. with the utmost despatch; and so tedious did this duty prove, that up to the latest moment it was barely completed.

The next object was the release of the vessels from the ice, still adhering to the bends and bottom, to about seven or eight feet beneath the probable line of floatation. In order to effect this without injury to the ship,

the space between the 'Assistance' and 'Pioneer' was commenced on by saws and blasting; but this proving tedious, owing to very heavy ice, ranging between seven and fourteen feet, about the 1st of July we tested the thickness of the outer ice to the nearest water, which we found to range from seven feet at our bows to two feet at six hundred yards seaward, where the water was fast increasing.

Brewing from essence of malt and hops had been practised as early as the 6th of August last season, but the general adoption of our "home-brewed" did not fairly commence until the end of October; with what success I shall leave my readers to judge from the following report of the officer who superintended. It was much esteemed, and at times mixed to dilute the excellent beer supplied by Messrs. Allsopp.

Her Majesty's Ship 'Assistance,' Wellington Channel, October 31, 1853.

SIR,

1. In compliance with your directions, I have the honour to report upon the beer brewed from the essence of malt and of hops on board this ship during the winter 1852–1853, as follows, viz.:—

2. An experiment was made on the 6th of August, 1852, to brew with the proportions prescribed by the makers (Hudson and Co.). Eighty pounds of malt and three pounds of hops were mixed with boiling water, and then started into a fifty-six gallon cask (filling it), placed by the side of the galley-fire: when the temperature had fallen to 90° there was added half a pound of yeast, in a state of fermentation, made by mixing dried yeast, sugar, and flour, in hot water; but although signs of fermentation were occasionally apparent at the bung-hole during the day, yet, from the low temperature that prevailed at night (consequent upon the absence of the galley-fire), it could not be got to work satisfactorily. The beer produced, although palatable and drunk by the ship's company, was so weak, from the inadequacy of the

quantity of ingredients used, and so flat, in consequence of the inability to raise sufficient fermentation, that it was scarcely equal to the smallest table beer.

3. On the 23rd of October, 1852, the ship being fixed in winter quarters, and the Sylvester warming apparatus at work, maintaining a constant equal temperature, brewing operations were commenced, with the view of keeping up a periodical supply for the ship's company.

4. The proportions used were,—essence of malt, 120 lbs., and of hops 4 lbs., to fifty-four gallons of water: these were boiled together for two hours in the ship's coppers, and then put into a fifty-six gallon cask, which was placed (for the purpose of obtaining the highest temperature in the ship, steady at about 70°) by the side of the funnel of the Sylvester warming apparatus. In about eighteen hours after, the temperature of the mixture had fallen to 90°, when yeast was added, and generally in a few minutes produced vigorous fermentation, which was maintained for seven or eight days, the froth being thrown off at the bung-hole and received from a leather spout, nailed on the side of the cask, into a tub placed on the deck, from which the cask was kept filled as it became necessary, for the first two days almost every hour, and afterwards at longer intervals, as fermentation slackened. As soon as it had ceased to work, the cask was bunged up and removed, to settle and fine for a fortnight; it was then broached for issue.

5. The beer thus produced was highly prized, and I think I may venture to state that, both for strength and flavour, it was all that could be desired.

6. From this time (October 23rd) until the end of the following April, a constant supply of this beer was maintained, at the rate of one pint for each person twice, and sometimes three times, a week, besides other occasional extra issues; for which purpose it was necessary to appropriate three fifty-six gallon casks,—one to issue from, the next to settle and fine, and the third in a state of fermentation.

7. The total quantities of the essences consumed during this time were—of malt, 1620 lbs.; hops, 44 lbs.; and the beer produced was 702 gallons.

8. Although the beer thus necessarily issued a fortnight after being brewed was of good quality, yet I would beg leave to remark, that had it been practicable to have allowed it to stand for a longer period (as in the case of beer brewed in England), there is good reason to suppose that it would have become scarcely inferior to English porter of the first quality.

9. There now remain for brewing (to be commenced, in pursuance of your directions, as soon as the hold is cleared), essence of malt, 780 lbs.; hops, 40 lbs.

I have the honour to be, Sir,
Your most obedient, humble servant,
JAMES LEWIS,
Clerk in charge.

CAPTAIN SIR EDWARD BELCHER, Kt., C.B.,
Her Majesty's Ship 'Assistance,' and Commanding Arctic Searching Squadron.

Mustard and cress were also raised, under the superintendence of the same officer, whose Report also follows. The supply was deemed, for our condition, adequate; but I am not prepared to state that it would have proved more than sufficient for the invalids, if we had been visited by any cases of actual scorbutus; but even as a salad, of which the French sliced potatoes and dried cabbage also furnished excellent substitutes, it was a most grateful change to the eye, jaundiced a little by want of the sun's rays. It is a curious fact however, that in my cabin, daily exposed to the light of candles, a decided green tint prevailed; this was grown either on white cotton, wool, or blue flannel, the latter covered from light. The wild sorrel might be found as a rare plant about us, but, excepting to botanical collectors, we did not derive any benefit from its presence, nor indeed from anything belonging to the vegetable kingdom.

Her Majesty's Ship 'Assistance,' Wellington Channel, October 31, 1853.

SIR,

1. In compliance with your directions, to report upon the growth of mustard and cress on board this ship during the last winter, I have

the honour to state, that on the 19th of January, nine boxes having been prepared, of about two feet in length, one in breadth, and four inches in depth, two inches of soil were laid in them, which was obtained from the roots of mosses found upon the land of Northumberland Sound; mustard and cress seed sown over the surfaces, and covered with a light sprinkling of fine mould. The boxes were placed in the main hold, in the vicinity of the Sylvester warming apparatus, where the temperature ranged from 60° to 70°, and the soil kept moist by water warmed to a temperature of 80°, and delivered through a rose fixed with a spout upon the side of a preserved meat tin: it required watering about four times a day.

2. On the 31st of January (thirteen days after sowing) the first crop was obtained and issued generally to the crew, affording about one ounce to each person; the soil was then cleaned and invigorated by the addition of a little fresh mould, and more seed sown.

3. The crops generally became fit for cutting in about a fortnight, depending upon the temperature that could be preserved, and on an average yielded between four and five pounds, and, although yellow from the absence of light, and less crisp and palatable than when grown under favourable circumstances, was generally greatly esteemed; and, in the absence of fresh vegetables, much sought after by the ship's company. Crops were thus obtained up to the end of April, the seed consumed being—mustard, 3 lbs.; cress, 3 lbs.; and the quantity produced, about 30 lbs.

4. On the 20th of June, a box having been prepared of about six feet in length, two in breadth, and one in depth, soil was made by mixing together a sandy mould, brought from Greenhithe, with that obtained on the land at the winter quarters, and placed over a layer of straw and coal ash in the box to the depth of four inches, when some early York cabbage-seed was sown over one-half and spinach-seed over the other, and lightly covered with mould: large panes of glass were put over the top, and the box placed on the side of the hill of Mount Beaufort, about thirty feet above high-water mark. An embankment was raised around the box to protect it from cold winds, and every attention paid to obtain a satisfactory result, the soil being kept moist by water raised to about 60°.

5. On the 27th of June (eight days after sowing) the plants began to show themselves, and from this time to the ship's leaving Northumberland Sound, on the 15th of July, made rapid progress, their tops reaching up to the under surface of the glass; they were then pulled

up, and filled a large dish: had it been practicable to have kept them, under such favourable circumstances, for three weeks longer, I think they would have repaid the attention bestowed upon them.

6. Turnip radishes were also tried in a small box, covered with glass, but, from the length of time they took to come up, the result could not be considered satisfactory: the short duration of suitable weather would, under the most favourable circumstances, render it impracticable for the root to acquire a size fit for use; but occasionally, in warm seasons, the tops might be raised to a sufficient size to be valuable as a vegetable.

7. The boxes used in the winter for the growth of mustard and cress were now employed more successfully; the same description of soil was used, mustard and cress seed sown, and the boxes placed, some under the glass covering of the main hatchway, the skylight of the gun-room, the glass binnacle covers, and others under panes of glass; and by being carefully tended, and watered with water slightly warm, plentiful crops of mustard and cress, in its natural colour and equal to any raised in England, were procured and issued to the travelling parties after their return from the spring search. The total quantity thus grown was about 25 lbs.

8. The seed supplied to the ship was—mustard, 20 lbs.; cress, 28 lbs.; and 13 lbs. of each still remain.

I have the honour to be,
Sir,
Your most obedient, humble servant,

JAMES LEWIS,
Clerk in charge.

CAPTAIN SIR EDWARD BELCHER, Kt., C.B.,
Her Majesty's Ship 'Assistance,' and Commanding Arctic Searching Squadron.

On the 6th of July I began to feel uneasy at the state of the outer ice; and, fearful that our return parties might be too weak to handle their boats in the rough ice, I despatched Mr. Loney with a cutter and eight men, with instructions to touch at Cape Sir John Franklin, Barrow Island, and Cape Lady Franklin, on the southern shore,

at which latter place he was to await the arrival of Commander Richards.

Our cutting operations proved heavy and very tedious. The snow bank between the 'Assistance' and the 'Pioneer' having formed into solid tough ice, compelled us to remove it piecemeal. This afforded practice to the men in the most effectual modes of removing ice: however, it soon became apparent that the off-shore pressure closed the cuts as they were made, and that our efforts must commence *de novo* from the outer verge at the water, where we had now sufficient space to float off our cuttings.

We had yet a difficult game to play; as we were threatened with infinite labour, should the ice move after our canal was complete. My mind had been made up to start on the 14th of July, and every effort was put forth to effect this object. On the 11th we had completed the first six hundred feet by sixty wide in twelve hours, meals included: the ice had been removed to sea, and dock-gates placed to secure it from closing.

On the 12th, before noon, the cutter was discovered under sail, and the ice-boat of the 'Pioneer,' with the banner of Commander Richards flying, in tow. We advanced to the mouth of the canal, and, opening the gates, admitted them. At three I had the pleasure of taking Commander Richards by the hand, and congratulating him on his safe return, after an absence of ninety-five days. As we had much to talk of, I sent him to his hot bath, reserving further communication until dinner.

At eight this evening the 'Assistance' was once more afloat, her course unimpeded, but we had yet to extri-

cate the 'Pioneer.' Commander Richards was the bearer of complete reports, as far as time would permit, from the western division; the originals were to be forwarded to Beechey Island, and included just the contents of Commander Richards's letter up to arrival there.

June 8.—This letter of Captain Kellett informs me "that Mr. De Bray, auxiliary to Commander M'Clintock, arrived on the 18th, having left him, with seventy days' provision, on the 2nd of May, in 76° 8′ N., longitude 116° 45′ W. To the northward, all the way to Cape Fisher, he could see land, apparently islands, forty miles off: these he will search on his journey home. Unfortunately, Mr. De Bray lost a man (John Coombs, stoker); he died from disease of the heart. Commander M'Clintock speaks in high terms of Mr. De Bray; he says he could not have had a better second.

"Mr. Nares, auxiliary to Lieutenant Mecham, arrived on the 1st of June; he had a disabled Marine with him: he left Lieutenant Mecham on the 3rd of May; latitude 75° 35′ N., longitude 118° W.; having crossed from Melville Island to Prince Patrick's group or land, whatever it may be. This name I have given to it, as it was landed on and taken possession of on his Royal Highness's birthday. All these parties will be back by the 7th of July.

"Commander Richards's coming here has been most fortunate; he will take direct to you all information relative to this part of the Expedition, and will also finish the Byam Martin Channel, the search of which I have been unable to undertake, for want of means. My intended movements are as follows:—1st. Should 'Inves-

tigator's' crew be found unfit to contend with another winter, I shall proceed with both ships to Beechey Island. Should I find no contrary orders from you there, I shall despatch 'North Star' and 'Intrepid' to England, taking 'North Star's' place myself. 2nd. Should they be found able to contend with another winter on the increased allowance of provisions, I shall despatch 'Intrepid,' the moment water makes, with that portion of 'Investigator's' crew now here, and reduce my own to thirty men and eight officers, with directions to proceed to England, depositing all the coal and provisions she can spare at Beechey Island, if it can be done without risking another winter within the Arctic circle, remaining here myself for the result of Commander M'Clure's attempt to cross the strait in his ship, and finally to remain next winter in this neighbourhood, if he fails in getting across."

The remaining parts of his letter, alluding to operations after becoming extricated, must wait for that consummation. Dr. Domville, whom he had despatched to survey the remaining crew on board the 'Investigator,' had not returned when Commander Richards left; but he seemed to think that she would be abandoned, which it is to be hoped has long ere this been done. These mousetraps are not easy of escape! In his private letter he adds, "Should I be obliged to stay, I shall send a party next year to the south point of Baring Island to look for Collinson, and one to Point Cockburn to meet yours or 'North Star's.'" Commander Richards gives a cheering description of their luxurious feeding, having been regaled with every known Arctic delicacy but sal-

mon, and that they promised, if he waited until it was caught. The following list of game killed exhibits at once the difference of our positions.

'RESOLUTE'S' LIST OF GAME KILLED BETWEEN 3RD OF SEPTEMBER, 1852, AND 6TH OF JUNE, 1853.

Animals.	Killed.	Average weight.	Estimated no. seen.	Remarks.
Musk-oxen.	39	300lbs.	500	In all probability the same animals were seen by different parties. Musk-oxen were seen near this position on the 6th of December, 1825. Two ptarmigan were shot on Dealy Island the first week in January, 1853. May 18th, caught a calf, size of a small lamb; died four days after capture.
Deer . .	10	160	250	
Hares . .	48	11	100	
Foxes . .	46			
Wolves . .	2			
Bears . .	1			
Ptarmigan .	81	2		
Lemmings .	5			
Geese (lately)	3			

We owe a deep debt of gratitude for all the mercies vouchsafed unto us. In all these travels, dangers, and difficulties, not one casualty has occurred, and health has prevailed. The cutter sent for relief arrived at the very moment required, and, as if every preparation had been anticipated, the passage nearly to the ship's bow was open. As Kellett and Richards both observe, "If you had made your suggestions, orders, to be executed, and drawn them out yourself on a fair sheet of paper, they could not have been more completely realized." The rendezvous, the discovered lands, south-west and north-east, have, it is true, all terminated like dreams realized or matters in course; they have caused no ex-

citement, no surprise,—they were almost outlined in August and September last, even before quitting England! The last speech at the gun-room table, on the evening before separation from our consorts at Beechey Island, was the injunction to the 'Resolute's,' "to observe the Rendezvous." Most gratefully and joyfully did I find my old shipmate beside me at dinner, relating his adventures; but his appetite was gone: after his musk-ox and venison feeding, he could not relish even a fair (pickled) Hogarth steak! So much for depraved taste: I know he does not admire walrus. But the main topic was the wonderful and peculiar discovery of the 'Investigator's' position on the return of Lieutenant Mecham. Will the cavillers at the expense of this Expedition now deem it absurd? May not Collinson yet be fortunate enough to overtake his second, and reach England quite as soon? But many a weary mile is yet to be travelled ere we all reassemble at Beechey Island, and there only perhaps to form fresh plans for the extrication of some unfortunate members of our own Expedition!

Richards was truly surprised to find our exit from this position no longer doubtful; for hardly had the cloth been removed, when it was reported that "the canal was open and ship afloat," a service executed in twenty-six working hours by sixty-four men.

On the summit, and within the cairn on Mount Beaufort, four hundred rations were deposited, duly secured in iron-bound casks. The staff surmounting is well marked with a tinned light flour-barrel at its summit; and several bands of lead nailed on spirally, bearing the requisite instructions cut with metal type-punches, put all

uncertainty at an end. Those would inform the visitor "that in the butt-end of the spar, closed by a well-prepared plug, full information would be found." The roll on which they were inscribed was protected by tinfoil and glue, again by bladder, and finally by tinfoil: it may last for ages. The casks and other pieces of wood strewed about them would afford substantial fuel for heat, as well as cooking: they were not reduced.

Richards found at the rendezvous, that Lieutenant Osborn had taken the boat and gone to the south-east, to examine the coast between Cape Lady Franklin and Cape Marshall, and Goodsir's furthest: as his date and provision would expire on the 15th, we should not be long in doubt. My orders for his guidance, sent by Mr. Loney, were left at the rendezvous. Richards and Loney then proceeded to examine Barrow Island, but without discovering the remotest trace of our missing countrymen. A cairn was constructed, and notice left; they then repaired to the ship. The sooner therefore we show ourselves on the dark-blue wave, the sooner our stray sheep will rejoin. A depôt was prepared for Loney's station, at the southern point of the bay. I visited my main station on Pioneer Island, and obtained a clear view around; took leave, and on the morning of the 14th, eleven months from the date of our quitting Beechey Island, started in the 'Hamilton' to place the depôt on Loney's Point, the southern and well-known station of this sound, surmounting it by a large blue and yellow flag, horizontally divided. I was yet doubtful as to the moment of starting, and had prepared provision for "sleeping out," etc. Having already ordered 'Pioneer' to have her steam up,

the signal to start was made, and once more I had the satisfaction of seeing the vessels in motion on their proper element. They were brought to a temporary block between me and Spit Island. This was eventually overcome, and I rejoined at eleven P.M., just before she entered another lane leading towards Cape Sir John Franklin, where Commander Richards and myself landed about one A.M., and visited the station on Mount Percy. All the southern land was well defined, but, aided by a powerful telescope, I was unable to discover the beacon on Cape Lady Franklin, or any trace of our boat. I remarked that the latter might possibly have taken the western side of Spit Island, and thus be hidden. The sea was still open up to the point, shutting out Cape Becher. We therefore rejoined and moved on: Lieutenant Osborn, having my instructions, would seek the vessels in that direction: further instructions and provisions awaited him at Loney's station.

July 15.—At midnight Lieutenant Osborn was seen at our floe-edge, and a party sent to aid him in the 'Hamilton.' The mode of direction to both parties was by placing two ship's flags on the proposed line of junction; each party keeping these in line,—although not in sight from each other, by reason of high packed ice,—must naturally meet.

Shortly before midnight Lieutenant Osborn rejoined. As I anticipated, he landed at Spit Island, and was asleep when I was seeking him by telescope from Mount Percy: finding the bay vacant, he moved forward without calling at the depôt on Loney's Point, and fortunately overtook the ship. His search of the southern coast of



Direction Signals where obstacles intervene.

Queen's Channel had been unsuccessful; and as all his news had been anticipated by Commander Richards, and both were weary (I had not slept for I will not say how many hours, and the ship was fast to the floe), we parted to rest.

Here we are all, thank God, safe, and in good health! Our advance too, even thus far, is matter to be thankful for, and in these regions almost another achievement.

The tedium of detention I shall pass over; we gained by it a longer sight of Barrow Bay and Johnny Barrow Mount than was interesting, and on the 17th we fortunately got inside the movable pack, and made fast to the solid land floe, with one anchor down, at eight P.M. The ice here was very heavy, and aground in seven fathoms, consisting of massive piled hummocks up to the shore. To be caught here undocked would be dangerous: still, there was barely depth to do this with safety, and a heavy stony gravel lay beneath. Ascending the high shoulder of this mountain,—which I named Acland, after that esteemed baronet, Sir Thomas Dyke Acland,—I found that it coincided exactly with an object which I had taken from Mount Percy, with the idea of making it a station, and from which it could be seen through a gap in the island intervening. It commands the north entrance to Sir Robert Inglis Bay, Capes Becher and Majendie, Dundas Island, and all round to Barrow Island and Long Island extreme. A very conspicuous cairn was here erected out of large masses of magnesian limestone, not likely to be affected by weather or time. Our dock was cut into four fathoms. From this height I discovered, about five miles off shore, what I suspected was an island,

in August last, almost a spit in the fairway; and not far from it an isolated mass of ice, evidently aground; two dangers which we have now time to determine, and as the ice at present does not appear to offer any chance of escape, the examination may afford amusement.

From the view which this mount afforded, I could trace open water from Cape Becher to a neck south-east from us, about seven miles, affording a broad triangular space of open water, within three miles east of our position. On the west it was met by another wedge of water about two miles beyond our island, from which, in a curve easterly, it formed up to our position at the floe-edge. All this ice appeared firm, and did not indicate any symptom of having moved this season near the small island. It was grounded, and appeared to have formed on it, not pressed up by violence: this little island, for the present, was termed Assistance Spit.

All the possible projections within and without the Queen's Channel have now been so minutely visited and searched, that I feel fully satisfied that Sir John Franklin's ships left no traces of their visit, if they ever passed up Wellington Channel, which we consider very problematical. I speak not of small cairns, because he never, with Fitzjames as his aid, would do anything by halves. But we have but too often been disappointed even by a moderate-sized stone, to pass over anything constructed of that material. It is true, cairns or piles will tumble; but they still leave enough to excite attention, although some of Penny's travellers have not so placed them that they are easily found: and the erection of two so near as Cape Majendie and Cape Becher, and placing them on

the chart so far asunder, nearly deranged my communications, Cape Majendie having been mistaken for Cape Becher, and there our depôt was placed. At all positions visited by this division the cairns have been rebuilt; should they tumble, they still will exhibit remarkable piles. Other observations on this channel will follow hereafter, relating to its uncertain navigation, which will probably dispose of the second question,—that of vessels being drifted up, subject to pressure.

Mount Acland is composed of rubbly magnesian limestone, without one trace of vegetation from summit to base! If I may use the expression, it is awful to behold these mountains of minute stones, difficult, from their loose rubbly nature, to walk upon, and piled up to the highest limits of these ranges. It is really a great relief to find rocks; and as in the present instance it happened to occur upon an inclined ledge, which furnished sufficient material for our beacon, a very conspicuous one was erected. I cannot furnish the honourable baronet with any particulars which may induce him or any other friend to pay it a visit.

Commander Richards was sent to examine Assistance Spit, as well the ice aground near it, and to try a few heavy charges of 20 lbs. on the main floe, having frequently experienced, in Melville Bay, that even our small blasts at times did great mischief amongst the whaling fleet, causing even distant docks to split unexpectedly; the use of our powder was not unfrequently condemned. Having erected a beacon on the small island, and completed his other work, he examined the grounded ice, where he found only three fathoms, with seventeen be-

tween it and the island; possibly it has less beneath the ice.

On the 25th the ice opened between us and the spit island: steam was called in aid, and about five P.M. we were again advancing to the eastward, but the tide evidently strong against us. At 11.30 we arrived at the end of the lead; made fast until eight next morning, when we again got free, and, by shaving Cape Becher in eleven fathoms, passed that important point. Mr. Herbert (Mate) had been despatched to the point to seek for letters, and to bring away those left by Mr. Cheyne in May last, if they should still be found. Our attention was, of course, intently fixed on the pile; and nearly at the moment that we discovered, by the aid of our glasses, that the kegs containing the letters had not been taken, "two boats were reported coming from Dundas Island." One was certain, and Commander Pullen shortly after stood on our quarterdeck, little less astonished than ourselves at such a meeting; he had come for these letters! I was right glad to see him, for I had much to inquire about and much to learn. Definitive instructions for himself, for 'Intrepid,' and the whole Squadron, had to be made out, and but short time in which it could be completed. I thought of detaining, and carrying him back in the ship. Fortunately for all concerned, he had left his men and depôt at Cape Phillips, and must return, thus securing the opportunity of forwarding our hurried and unopened former despatches. We were detained just beyond Cape Majendie: there we hung on by the floe until morning, when I took leave of him, instructing him to place a cylinder containing a record of

our meeting, etc., on Cape Majendie, with which he was supplied.

Being now in full possession of all our intelligence, and knowing the interest which must be felt at home, about the great object of this Expedition, as well as of our present proceedings, I directed him "to be prepared to leave Beechey Island on the 1st of September, and proceed to England, taking on board the crew of the 'Investigator,' should they arrive by the 'Intrepid,' and to leave the latter vessel as depôt at Beechey Island." I fully expected, at this moment, to reach Beechey Island, in this ship, before him, and long before that period direct in person all the necessary arrangements.

From this date until the 17th of August we continued to move from spot to spot, seeking easting: opinions very conflicting and unpleasant in their obtrusiveness were hazarded,—"too many cooks" never were more apparent. The south shore was the favourite; however, thank God, I took the north, and moved in that direction with all speed; not from the littleness of having my own way, but because no opening, after reducing opinions to *record*, was truly seen to the south-east; that the three Ice Quarter-masters, closely questioned daily, saw no prospect by that direction; that Penny's remarks, which Sir Francis Beaufort had obtained from him at my request, distinctly opposed any navigation on that side, and he had travelled there; and finally, that at this date last year we had navigated the north side, and found it clear, when I, from the heights above Cape Hogarth, was well satisfied that the ice blocked the space between Hamilton and Dundas Islands, and appeared moreover to press

southerly. All the northern channel was then free; but to silence future cavil, the ship was pushed to the southern navigable extreme. We had experience against presumption. As the spring-tides would probably bring danger, I deemed it imprudent to risk further ships or lives, and therefore determined to take the north lead. We shifted, and were scarcely well secured, when the ice took a westerly set; our floe was firm, therefore we went bodily, sheltered by a natural cove or dock, and flanked by very thick ice.

The spring-tides occurred on the 18th, and I relied much on this event for some decided move; unfortunately, it was in a wrong direction, or, if my own suspicions are correct, I lost my chance by quitting this shore at all! Our boat landed once in open water, well to the *eastward* of where we now were; a gale ensued! We continued to drive, apparently for the strait between Cape Becher and Dundas Island. The barometer fell lower than before noticed, suddenly from 29·64° to 29·34°. We were now drifting rapidly to the westward, our depth of water decreasing from thirty-seven to eleven fathoms; and, as the snow-storm intermitted, discovering to us the near neighbourhood of Cape Majendie under our lee! "When things are at their worst they mend."

The great floe continuing to turn in azimuth, like a wheel, to the westward, fortunately tended to throw us into the channel, between Cape Majendie and Dundas Island; not certainly pleasant, but nevertheless affording hope of safety. At this crisis, providentially, the ice to leeward became blocked, or possibly was in part resisted by an opposing current. We ceased to drift, but had

shoaled our water suddenly to eight fathoms, not far from a low point spitting westerly from a very tempting bay, in which I had for some time fancied that shelter could be obtained, provided the depth afforded safe riding. Our greatest danger however still threatened: unless the ice to windward was arrested in its motion, it would inevitably crush us in a few moments! and this was feared. One of the Ice Quarter-masters observed: "If the weather floe parts, Sir, it will walk over her!" Not a very pleasant prospect! The customary preparations for deserting the ship were already cared for, and we waited, in great anxiety, the result of the next half-hour. If both vessels were annihilated, life, I think, might possibly have been safe; but we had two sick men, cripples, and for these my interest was principally engaged. The weather ice was arrested, as afterwards ascertained (under frightful pressure, higher than our lower mastheads), on Point Preservation; the gale lulled, and I was able to send a boat to sound up to the land-floe inside the point before alluded to. The report of "eleven fathoms within, and nine close to the point," soon put a new face on affairs; warps were run out to windward, and, under trysails and jib, the ship soon reached one of the most secure little ports in these regions. On landing at the spit I found the depth "close to" sufficient, if compelled to winter, to admit of the vessels securing to the land, having six fathoms at sixty feet from the beach, and space for twenty vessels in the then open creek, which carried to its bend, at a later date, ten fathoms: to this I gave the name of Port Refuge.

The view from the hill now forcibly impressed on my

mind the advantage of *decision:* if the Captain is not fit to command, he should not be selected; the lives of all are in his keeping,—one false step, and no one survives to tell the tale! The great evil entailed on this service, at a period when no great experience entitled the Commander to be decisive, and he had Ice-masters to help him, was the referring to Council, or, as I now view the case, to relieve himself from the responsibility of any unfortunate event which was liable to be contested by those under him. At that period the Expedition was composed of officers of nearly the same rank; the case is now far different, nor do I require any such protection.

The position we had lately occupied was now closed in with heavy, hummocky, pressed-up ice,—and no trace of floe, such as we left. Probably the ice to which we were then fast, and having a very wide crack, leading possibly miles easterly, now formed part of the piled-up masses on Dundas or Margaret Islands, or, if it escaped these, passed up the Queen's Channel! I felt grateful that the pressure had not been tested by the vessels under my command; for there I do not believe that life would have been saved. Easterly, the coast was lined with larger masses of ice than we had before noticed, grounding in three fathoms and a half, and pressed so heavily in upon the shoal line that it interfered much with my purpose of making my escape between them and the land. Viewing the coast westerly up to Cape Majendie, we had to be thankful that we were not cast upon that unpromising iron-bound coast. Such then being our own escape, my thoughts naturally reverted to the case of the missing ships; any similar casualty

might sweep them from the face of the deep, and leave not a trace behind! The presence of a consort could not avail; they are generally, as it were, linked together, particularly when beset in ice, and the same fate to both, in our case, would certainly have resulted.

Here then our present prospects were at least painfully delayed, and by many were considered to be entirely frustrated for this season. But although opinions were perhaps too openly expressed, I deemed it prudent to be prepared for taking the pack again, asserting distinctly, "that the vessels should not winter there." In order to keep up the excitement, I first made the survey of the port, and then started in my gig to determine how far I could safely take the ship within the grounded hummocks. Day by day led on to fresh advances, until I gained the heights about nine miles easterly, close under which Mr. Grove had landed in open water on the 15th of August! We can only imagine that an overruling Providence directs us! One of two events might have occurred; the first was our possible escape into the eastern open water, at this moment clear up to Point Hogarth; the next our unmistakable demolition, had we been pressed on Cape Preservation! The height of the ice piled there, within which our boat entered freely at high water, was not under eighty feet on the inner side, where a sloping *débris*, composed of finely comminuted particles of the purest white ice, fell inwards. To seaward it was piled with enormous blocks of ice, one over the other, in perfect confusion: not ordinary ice, but of the same quality as that grounded in three and a half fathoms along the coast, varying from twenty to twenty-

four feet in thickness! A very narrow neck of thin floe, easily to be mastered if we could reach it, cut off our communication with the lanes, constantly opening and closing, but near to Port Refuge closely sealed. The inshore "lead" was not deep enough for the ship, being barred at Cape Simpkinson by a rocky ledge, on which two fathoms only could be attained.

At this Cape we shot eight hares: five the first day, and three the second. This therefore afforded some little excitement, and the ship's company had permission to share in the amusement, killing some hundred of kittiwakes and tern, with one hare and eight ptarmigan. These cliffs are frequented by gulls, lummes, dovekies, and other birds, which build their nests in rocky ledges of the beetling cliff, in order to secure their young from the depredations of foxes and other predatory animals, and are generally, when sufficiently stocked, termed "rookeries:" one at Cape Shackleton, in Melville Bay, and another near Upernavick, are well known to the whalers, as well as Arctic explorers.

By some unaccountable peculiarity I make up my mind to effect an object, at a moment when no chance of its accomplishment is apparent! Not that I would attempt it against reason. The reverse: I rather spare labour, when I can do so conscientiously. I took my last survey of Port Refuge, killed several ducks and a ptarmigan, and overlooked the principal features of Sir Robert Inglis Bay from Mount Croker, situated at what we had at first deemed the almost out-of-range depth of Port Refuge, but to which access was now open by water within the ice. From this height I discovered,

what indeed I had before suspected from other glimpses nearer to it, that a lake and stream connection existed between this and the eastern *sac* of Sir Robert Inglis Bay, and that not more than one mile divided the two waters. Westerly, I noticed the ice to be easing off at Cape Majendie, and lanes forming along the coast towards it. A vacancy is always of importance, and to us of infinite value,—as it would facilitate the opening of similar lanes to the eastward. I felt suddenly confident of release, but all the reports from the hill were unfavourable: indeed the Ice Quarter-master, who had most to *say*, pronounced the floe *sealed* for the winter. Further, the bay ice had formed so thick, that it was not possible for a boat to pass to the shore without considerable labour in breaking a channel. However, a night would intervene, but the cold was more intense, and the ice firmer. I asked the Ice Quarter-master, at four A.M., what he thought of it? "No opening, Sir," was the reply. I may be obstinate, but I told the "old man" (Unthank) I intended to cut out; he quietly and very drily whispered to me, "Well, Sir, if you are *determined*, lose no time." Those words were electric,—took a load off my mind; I was up, out, and moving. Leaving orders "to prepare for sea, and clear the lead to the outside barrier," I mounted the hill, and there noticed that outside of our opposing barrier rather an unwieldy and awkward floe was freely washed externally, and that if this could only be mastered, by cutting and blasting, my intention to take the pack, following up the outsides of the grounded ice, might enable me to squeeze by Point Preservation. The distance from hence to Beechey Island, one hundred

and twenty miles as the crow flies, was too far to transport crew, invalids, and effects, if compelled to abandon next season. Effort must be made, and I had resolved on it. Lieutenant Osborn was directed to take a party to blast the outward barrier. Boats were employed in beating and hauling through the bay ice, so as to disconnect it as much as possible, and the ship having been warped up to the barrier floe before noon, the 'Pioneer' followed under steam. Repeated reports were brought to me, "that the ice closed as fast as blasted:" this I heeded not. All our available force was now sent on the ice, and I took the command in person; the vessels moreover were now well wedged in, and no chance of retreat. Several heavy blasts were applied with great effect, followed up by the expeditious removal of the outer disrupted ice; and by the aid of steam, both vessels began to move cheerily ahead. "Sauve qui peut" soon became the general motto; and each man springing to his proper vessel, shortly after noon they were once more under canvas, and moving to the eastward. Let any man read the log of that day, and judge simply from its wording if it was intended to illustrate any such feat.

Before entirely taking leave of Port Refuge, I will merely remark, as to its geology, that the same dreary, dirty, grey magnesian limestone, with but few fossils, prevailed; and vegetation, excepting in the inner valley under Mount Croker, where deer or musk-oxen had rooted up great spots of deep moss, was very rare.

On the summit of Mount Croker, whilst engaged with the theodolite, I noticed a very beautiful white ermine (*Mustela erminea*) in its summer dress. My aide, Mr.

Pym, was despatched to shoot it; but he failed, although the animal was daring enough to sit up and spit at him within twenty yards. The bifurcation of his fine bushy black tail was beautifully displayed, and probably somewhat disconcerted Mr. Pym, spoiling his aim. I believe however that it was wounded, and effected its escape by the crevices of the rock. Nearly at the same moment a ptarmigan (mistaken for a goose or deer) was noticed: on my return it was butchered, by getting suddenly on it before I perceived it; however, in these times we kill for the cook, not for preservation.

Our collection from the sea has been more abundant than I could have imagined, an account of which will appear with the Natural History. The *Euryale* or *Asterias Medusa* was found in great numbers in deep water, and on one occasion so bematted a swab, that extrication, without destroying the arms, was not possible: one complete specimen only, to establish the species, was preserved.

After a detention of a most harassing nature for thirteen days, we were again free, and pressing forward. But before quitting this region let us examine the relative temperatures experienced by Parry and ourselves. During the entire month of August, 1820, I notice that he experienced a minimum temperature of 22°,—colder than we have experienced at all,—the lowest, at four A.M. on the 31st of August, corrected, being 24·5°. As he had quitted the entrance of Lancaster Sound before the 1st of September, we cannot follow him; but at Port Bowen, a much more suspicious position, it did not fall below 16°, and that not until the 18th. I consider that as far as the 16th of October of that year I would not have

deemed myself sealed. His escape again on the 1st of September into warm water precludes further comparison with the probable temperature in the mouth of Wellington Channel.

September 1.—Our first effort carried us abreast of Cape Simpkinson, where, finding the pack drifting westerly, we made fast to the grounded ice, in eight fathoms, to await the return of tide. But I find that the tides in this northern bight are not to be reckoned on, and in the present case, fortunately perhaps, they overran their mark to fifteen hours. Foreseeing the reaction, I gave orders, before I retired to rest, "to select a convenient tug floe, and make fast to the moving pack when the tide changed easterly," which would infallibly advance us. This occurred at 3.30 A.M., when the pressure gradually eased; and shortly before eight A.M. we were again taken in tow by the 'Pioneer,' keeping close along the line of grounded hummocks, and on arriving abreast of the immense mass before alluded to off Cape Preservation, had fifteen fathoms close alongside, the sea washing its base. These huge masses of ice furnish most valuable guards for pilotage, seldom grounding in less than three and a half fathoms, with deep water outside. I had suspected, from noticing the vast collection of pressed-up ice at this point, that they were obstructed and retained by an outlying ledge of rocks; but the heavy masses then noticed merely adhered until the pressure was relieved, and then by their weight had been swept away. The customary law of the immersion of six-sevenths we found not to hold here, nor are the under surfaces level: masses more than six feet out of

water were grounded in two fathoms at high water! but these must have had a great admixture of snow. I had almost fancied that my vision of open water up to Point Hogarth was not to be realized, and that my efforts after all might be attended with some drawbacks. But about noon I caught a glimpse between the masses of ice, and felt that all was secure. This was indeed a triumph: talk not of horse-races, or any games of chance! Here was a consummation to repay all my harassing labours. Giving the men time for their dinner, the cheering sound of "Hands make sail!" brought up many an inquiring face. But there was no mistake this time: the open dark blue sea was before us! How different were the feelings of forty-eight hours!

What the sensations were of those around, I was unable to discover; but I had the deep satisfaction of feeling that I had, by the blessing of God, effected my object, and impressed all the well-disposed men under my command with the determination which will, I trust, under the blessing of God, enable me to do my duty, and that where I *decide,* no puny obstacle or difference of opinion shall deter me from the accomplishment of any service I may deem it necessary to execute. If I had failed, no disgrace or reflection could lie. Still the story would run, that I made the *attempt,*—and thus close the mouth of the busy chatterer.

The questions now discussed were not of *failure,* but of the *hour* of arrival at Beechey Island, and if we should save post by the 'North Star'! Shortly after two the tow-rope was let go, and under every possible stitch of canvas, the ship was making nearly seven knots. But

alas! our calculations were premature. About four P.M. indications of ice ahead were reported, and we were reduced to the necessity of selecting the most comfortable berth which offered amongst the patches of open water, about ten miles to the north-east of Cape Osborn. Unfortunately, the 'Pioneer' shortened sail some miles astern, and before she reached the gap by which we had entered, it had closed, and separated her so far as not to be of further assistance until the communication was opened.

During our detention here we determined our position to be in lat. 75° 37′ N., long. 92° 22′ W., Cape Osborn bearing S. 18′ 18″ W., the variation 144° 58′ W. Our distance from the nearest land was about one and a half mile. A party consisting of Dr. Lyall, Mr. Pym, Mate, and Mr. Lewis, Clerk in charge, started with a light boat to endeavour to reach the land, and walk on to Cape Osborn, on the summit of which we thought we could discover a large cairn or tent. They were unsuccessful, owing to the roughness of the ice, and the inefficiency of their party to drag the boat over the distance which intervened between us and the shore. It was in the sequel most fortunate.

CHAPTER XIV.

First symptom of Winter.—Alarming Discovery.—Suspicions awakened.—Escape from a Nip.—Recent fragment of a Ship.—Drift-wood.—Party for Beechey Island.—Despatch of Lieutenant Osborn.—Want of Steam-power.—Unsafe position.—Aid sent to Lieutenant Osborn.—Inland Lakes.—Fishing.—A Spar found.—Trunk of a Tree.—Disturbance of the Ice.—Fragments of a Ship.

September 3.—At midnight there was not sufficient light to read the deck thermometer without a candle, and quite dark in my cabin. We are now to the northward of Eden Point in Baring Bay, and in eighteen fathoms water. A bear was noticed between Cape Osborn and the ship, but he most cautiously avoided any nearer approach, or within any distance to warrant pursuit. As the 'Pioneer' was completely cut off, our efforts were now incessant, taking advantage of every motion of the ice which enabled us to get into the in-shore water, hoping to secure to the grounded ice, and thus prevent being swept back.

On the morning of the 4th I sent Lieutenant Cheyne, with a gig and one watch, to aid the 'Pioneer,' whose services we very much needed, the open lanes rendering constant warping tedious, and I had the satisfaction of

seeing that at least she was moving. Our progress, being free from obstruction, was more rapid, aided I imagine by a current along the shore; and by six P.M. we succeeded in warping alongside some stupendous masses of ice or fragments of bergs, grounded in eleven fathoms, and raised above water about forty feet. Whilst engaged in warping along these, the look-out in the crow's-nest reported "something like a coal-bag and a uniform cap, lying on one of the detached in-shore floe-pieces." Our glasses soon detected the black object to be one of Halkett's India-rubber boats! Mr. Grove, Mate, was immediately despatched with the light boat, which the party hauled over a low neck, and reached the objects. On his return he brought the India-rubber boat (the bellows having been mistaken for the cap), a tin case containing the Admiralty Arctic Chart, the true-bearing book of 1853, two tin pannikins, a hank of log-line, bits of lint, a pill-box containing ointment, and a piece of adhesive plaster, —with other proofs of its having been the temporary resting-place of man!

That all the articles in question belonged to our Expedition was clear by the date of the chart, as well as the true-bearing book for *this year*, within which was further found a printed prayer belonging to the 'North Star,' as well as one in manuscript, evidently in the handwriting of Commander Pullen: the chart was also his, having on it his remarks on his late journeys hitherward. But the Halkett's boat created a doubt, as the 'North Star' was not supplied with one, and yet it bore the broad arrow; it might therefore have come from the 'Resolute' or 'Intrepid.' As soon as the ship was se-

cured for the night, I returned with Mr. Grove to examine afresh the spot where these things were found. The boat had evidently at first occupied a place on the floe, where the sun or the heat of the man's body had impressed all its leading marks very perceptibly on the ice. It was painted black, and therefore by the ordinary laws of nature should have been more deeply imbedded, as the lighter-coloured articles had sunk in deeply, and become well frozen; but the breeze had blown the boat over the ledge, and it there hung, attached by its frozen lines, as a signal of distress: Nature's own act! No further clue could be gained. The bay ice was forming so rapidly that Mr. Cheyne's party were hauling the gig *over* the ice; but where we were, the boat easily cut through by the velocity afforded by the oars. On Mr. Cheyne's joining, by signal, he was instructed to search the inner masses of ice, whilst I continued to follow up the line of gale of the 18th of August, to which date I immediately assigned this alarming catastrophe. It is almost needless to add, that suspicion of misfortune to Commander Pullen predominated, as I could not for a moment imagine that he would trust any other person with such documents: I also felt assured that it resulted after his return to his ship. No further traces were at present discovered.

Here was matter for most serious consideration, and involved advance or delay! But it was clear to my mind that if any misfortune occurred to a party in this immediate neighbourhood, that traces must be sought for on their return to the 'North Star,' and that the nearest land would soon furnish evidence of their resting-places.

For this purpose I despatched Lieutenant Cheyne and Dr. Lyall to examine the coast for traces, cairns, etc., and to visit, if practicable, the shelf-summit of Cape Osborn, on which I had imagined that I saw a very large cairn,* now transformed in importance to a tent.

September 5.—The 'Pioneer' rejoining at 4.30 A.M., again took us in tow, but not making sufficient progress to overtake the land party. The boat's crew, on their return, reported having seen the remains of a bivouac of last season, where tea-leaves and preserved-meat tins were distinctly observable. About two P.M. the party returned without finding traces of any late visitors. A loose, disturbed *cache*, formed from the stones of an old Esquimaux encampment, was reported by Dr. Lyall.

The ship having gained the bay to the southward of Cape Eden, the 'Pioneer' fouled her fan with our tow-rope, and was placed *hors de combat* so long, that we warped, on and had gained a very critical point, when she came up, but too late to carry us through and rather in our way astern, as a very serious nip was on us, and we barely escaped between two such huge masses of ice, one aground in six fathoms, that our fate would very soon have been determined. The angular tongue of a huge floe-piece—how many feet thick I cannot say—had taken its hold just under our fore-channels. Our opposite broadside took against the grounded hummock, half-way up our rigging. Fortunately a twenty-pound blast broke the nip at the critical moment, and

* This supposed cairn turned out to be a very remarkable pyramid on a jutting buttress of the cliff, showing out on particular points of view, but beyond the actual Cape.

she eased astern. Let no one sneer at blasting ice; this alone saved the 'Assistance.' We were very glad now to take refuge under the lee of our big enemy, where most beautiful docks were already prepared, but too insidious for any dependence. The power which placed them there could as easily move them, and the collision would destroy us in a moment, even in calm, and without one instant's warning! We had therefore to select our ground, and cut in so as to be frozen steadily, until we could make another move. It was very tantalizing, as well as distressing. More power, more activity, would probably have placed us beyond the barrier which now closed us in as if for ever!

Being now fast and fixed until it pleased Nature to release us, I despatched Mr. Grove to take the shortest course to Cape Osborn, and examine the cairn; but I had been much deceived by the distance, as well as by the nature, of the intervening ground, as well as its accessibility. He returned, after an absence of ten hours, unsuccessful, but he determined that the object was a natural heap, not a cairn; no traces of travellers were noticed along his route. The party reached the ship about five A.M. on the 6th, much fatigued, and the fog which prevailed tended much to increase their difficulties. Mr. Grove found three pieces of wood, two very old and weather-worn, but one recent, of teak, painted black on one side and having a new nail through its end. It had recently been cut by a fine saw, apparently for firewood; the nail had not the Government mark.*

* This proved to be part of the 'Breadalbane,' wrecked fifty-five miles to the southward.

It is a curious question, but, trivial as it may appear, no less my duty to record. How does it happen, throughout this northern line of connection, and out towards Jones's Sound, that nearly all the truly drift-wood found by our parties might have belonged to the same tree?—never recent, and impressed with Nature's own seal of one particular epoch. Let the fragments preserved answer for themselves. When are we to expect a new and different supply? This piece of teak will doubtless be traced, in a few days, to some definite cause of action; it simply assures me that the Wellington Channel is, or has been, open: at present I suspect it to belong to the 'Mary' yacht.

September 7.—The morning, ushered in by thick fog, has terminated in a gloomy, wintry day; the barometer is slowly falling, and with it all our high hopes; the breeze also is freshening from south, and the ice betraying symptoms of uneasiness. We have no bed of roses here: independent of the safety of the vessels and crews to dwell upon, much matter for severe thought remains. The present wind may be our security; but should it haul westerly, even these barriers to which we are fast would afford no protection,—perhaps destroy us; our trust only is from above; our motto, "Trust in God, and do your duty," renders every disaster comparatively light.

Fully impressed with the belief that a party in search of us has attempted this eastern side of the channel, and may possibly have simply lost the articles discovered, I directed a depôt of eighty rations to be formed on the near terrace of this bay, surmounted by a yellow flag,

that colour being best seen either on a dark or white ground; indeed experience has taught me, that as a general beacon flag, the yellow-blue horizontal can be distinguished beyond all others. At noon the temperature was 30°, but with every indication of approaching winter; and as I remained uneasy about our position, the Master was sent to mark out the shoal-line at which we should take the ground, if driven in, so as to enable us to make suitable preparation. This was effected by boring holes and sounding, leaving staves at three fathoms. It appears that we had about a hundred yards to drive before taking the ground.

On the 7th preparations were made for sending a party in the 'Hamilton' to Beechey Island, in order to ascertain the state of things there. As to saving the chance of letters by the 'North Star,' my orders, if open water existed, had taken effect on the 2nd, or some other channel had offered. I could only forward my report of movements up to the latest date, for safe deposit, until some chance offered; for this service Commander Richards volunteered as a matter of right, but I could not spare his valuable aid at such a critical moment, and Lieutenant Osborn was therefore allotted to this duty. My own well-tried crew were selected, substituting the ice-quartermaster of the 'Pioneer' for my coxswain, whom I could not spare; and my light dog-sledge, constructed to carry me and forty pounds' weight of instruments, was added, to carry light loads at difficult or tender passes; five days only of provision were allotted, and every useless weight left behind.

On the 9th, dirty, snowy weather; barometer, 29·45°;

temperatures ranging between 7·5° and 15°, and the ice nipping. Made an attempt to cut towards the nearest pool of water, but failed; the ice was found to be fifteen to twenty feet in thickness, bay ice six inches, the water clearly making round Cape Osborn and to the northward. Tantalizing indeed to be mewed up; but patience! we were nearly as bad in Port Refuge, and yet escaped. In this position we are sheltered; but overhead the gale is evidently blowing hard from north-east, scud flying rapidly, and the outer ice, in active motion, pressing to the other shore. Every effort was now made to complete my documents, tracings of charts, etc., in order to forward them to Beechey Island; and very harassing it proved, independent of constant calls for other duties. At noon, barometer 29·34°, temperature 12°, falling to 2°; at midnight the wind abated, terminating in calm.

September 11.—At four this morning I was informed that the open water extended from Cape Osborn to the opposite coast. At five, Lieutenant Osborn, assisted by a party from the 'Pioneer,' started, having received despatches, etc., the preceding evening. Commander Richards took the hands to the outer floe-edge, in the hope of blasting off the outer ice, which might also shake the entire floe, and cause it to drift off with the tide. The day was beautifully fine, but this was found, under the present temperature, 18·5°, with bay ice forming and negativing every movement, quite beyond our powers: the mean depth of this immense floe-piece being about seventeen feet, proved rather too much for our ice-saws, over so great an extent. Mr. Allard, Master of the 'Pioneer,' accompanied Lieutenant Osborn to the floe-edge,

launched him, and then visited Cape Osborn, from the summit of which he would have the opportunity of judging how far the open water prevailed below that position. Unfortunately, the present calm favours the formation of bay ice, which may compel the party to seek the in-shore floe. The following, I perceive, are my remarks on this day:—"11*th*. Beautifully clear, with a temperature of 18°: and tantalizing indeed is it to witness the opposite floe in rapid motion to the southward, when our position is such that little short of Nature's aid, in the form of a heavy gale, or of an off-shore set, can release us." Had such obstacles as these opposed us but a few weeks since, or even now, with open water into which to float our fragments, we should not have despaired. But now stern Winter holds up his threatening finger, and tells us in plain terms, "You have no business here with such puny steam power." Query: what will he say to 'Resolute,' if he should triumphantly have 'Investigator' ready at Melville Island before the eastern barrier gives way, and but *one steamer* to tow *both?* I cannot forget the astonishment, in 1851, when I proposed the screw steam power in these regions. Increased power was denied me in 1852. Yet I have been made to feel its loss. Eventually the country may experience it by our detention this season. Moreover, no junior should in these matters tow his superior. The result in money remains to be totalled.

As to our eventual release this season I have my own impressions; they may be erroneous, but I still cling to every plausible reason on which hope can be based, preparatory to taking that most decisive step, "housing

over" for winter. When that event takes place, our men will exclaim, "Well, here we are for certain."

As to any prospect of such a dilemma, I at present dissent. It is not my intention to remove anything out of the ship, but simply to secure as much internal comfort as circumstances will permit; more, probably, if I err not in my reasoning, than last season; but to be prepared to be moved at any moment that it may suit the caprice of Dame Nature. The grounds upon which I base my opinion are as follow. First. Notwithstanding opinion is against me, I consider this position unsafe, and that we are liable, even throughout the months of October, November, and December, to be driven from hence. The American vessels were entrapped in the pack, and comparatively safe: they had no prospect of open water, it is true, but that is a *danger*, unless you are prepared with a port where shelter can be obtained. They were compelled to perform certain gyratory movements during these months, reaching the neighbourhood of Beechey Island about the 22nd of December!

Now all these same causes are visibly in operation, and it is only necessary for "the turn of the wheel" to take a liking or involve in its chances our frail barks, and off we travel on the tangent (if not crushed) into mid-channel. The scaling of the main pack to that connecting us is the act of a few hours. Who will venture then to dissolve the connection? I trust that it is scarcely necessary for me to illustrate this by diagram; for the ice motion is so capricious, that direct, lateral, oblique, or rotary force will perform all we have to fear in a few hours, leaving us to solve the problem in winter,

by sounding through our fire-hole, over depths varying from six to six hundred fathoms, and making accurate charts of our motions by aid of the stars and chronometers. These are no idle whims or caprices. When that moment arrives, all I pray for is, that every man may be as well prepared to do his duty.

To sum up, I intend to be prepared *to take, or be taken by, the ice*, if it should so suit the will of Providence. Keeping in view that if such should happen before the end of October, to endeavour to keep on this side, and if drifted as far as Beechey Island, attempt to reach Union Bay and there cut in, or possibly be saved the trouble by a nip.

Of my mode of housing, when winter seals our position, I shall deal hereafter,—preparing at present the important outlines, so far as our resources will admit.

September 12.—Late last evening, about five, Mr. Allard returned, having fallen in with Lieutenant Osborn, not far advanced. He had abandoned his boat, had placed the weights on my dog-sledge, destroyed it, and, by a note, suggested that a sledge and more provisions should be sent to him.

Dr. Lyall having volunteered,—and considering him, for many good reasons, the most effective aid as well as companion,—I again sent my own sledge, which carried the 'Hamilton' last season; and if so laden, would then have sixteen persons to take her through her difficulties, with instructions "to accompany Lieutenant Osborn, if necessary, the entire distance;" and keeping in view the peril incurred last season, and the misfortune, but too apparent, of *recent date*, instructed him to inform Lieute-

nant Osborn that no uncertainty should exist, or that the boat must accompany him. About eight P.M. Dr. Lyall started. This diminished our crew by twelve working hands.

I walked out to the floe-edge, nearly a mile, with Commander Richards; but it was very clear to me, that with the bay ice formed, it was useless to attempt any further operations for cutting out. On my return I ascended the hill immediately above the ship, where I obtained the latitude as 75° 32′ N., and a very clear view of the late space of open water, now skinned over with bay ice. The heavy hummocks, where we had picked up the Halkett's boat, were still fast, water-washed, and free from floe! Had we fortunately held on there, we should possibly be now at Beechey Island. However, to the decrees of fate we must submit cheerfully. Moving along the land-ridges I visited the deep ravine, where probably, at some remote period, a river rolled impetuous into the sea. It had cut its channels deeply, and in some instances was bounded by abutting cliffs on either side, narrowing it to forty yards, and again expanding into five hundred; heavy rounded stones and radiated channels affording the impression of a vast flow of water. It was active even at this late season, and where we frequently broke in, the stream was running beneath with a rivulet power; on the west also there was evidently a waterfall of some twelve feet. But there were very extensive inland lakes to warrant this constant escape of water, and their corrugated margins clearly indicated, although sheathed with six-inch ice, that their level was daily decreasing. In one of these, attempts were made

to take fish by a small net of twenty feet span, and the bottom was scraped by the dredge, but without success: unfortunately, the seine ordered to be embarked in the 'Pioneer' was left behind, and thus all hopes of salmon, or large fish, frustrated. On my return I observed two of the officers bearing between them a hare they had killed, and immediately where we then stood the tracks of several, or of the same animal, were noticed. One evidently had been pursued by a wolf, and a very smart chase it must have proved; but which might have proved victorious I was too far fatigued to follow up; the traces proved that the fore-paws of the wolf at each bound were never two inches behind those of the hare, and the measured leaps of several averaged six feet: evidently in earnest!

A party which I sent to erect marks on the neighbouring hills easterly also succeeded in killing a hare; so that we have some hopes of not being quite so badly off for game as at our last (but very secure) winter-quarters. This set all the sportsmen agog, and eager for sport; and of this feeling I did not fail to take advantage, despatching one party, as far as they pleased to go, northerly, in hopes of gaining some further information as to traces of the late boat party in that direction.

The issue of one of these excursions, by our leading huntsman, the Boatswain, was the discovery of a spar, about a mile and a half inland, which, from the report, disturbing me about midnight, was "evidently the top-gallantmast of a ship;" the carpenter's mate, who was one of the party, being of opinion "that it was a worked spar, of about eight inches' diameter." Such a report from

such authorities startled me not a little: one point however was not so clear to my imagination,—it was too far inland, and moreover in a hollow. Sleep however, for the remainder of the night, was destroyed.

On the 13th, after breakfast, I proceeded, taking with me the Boatswain and my boat's crew, with picks, crows, etc., to search for and bring in the discovery. It was not without considerable difficulty that it was re-discovered; but I at once perceived that it was no spar, and not placed there by human agency: it was the trunk and root of a tree, which had apparently grown there and flourished, but at what date who will venture to say? It is indeed one of the questions involved in the change of this climate. As the men proceeded with the removal of the frozen clay surrounding the roots, which were completely cemented, as it were, into the frozen mass, breaking off short like earthenware, they gradually developed the roots, as well as what appeared to be portions of leaves and other parts of the tree, which had become imbedded where they fell, and now were barely distinguishable—at least not so much as some impressions on coal—to the casual observer. At the period that whales were thrown up and deposited on these mountains, the land generally convulsed, and also when a warmer climate prevailed here, this tree possibly put forth its leaves and afforded shade from the sun: most fervently did I just now wish for its return. The stump was extracted, and, with some of the surrounding soil, preserved for future examination. Two neighbouring mounds were also dug into, but they proved to be peat; —doubtless other stumps and vegetable matter, the only

remaining traces of what might, at some distant period, have been a forest. All the surrounding earth and tufts of grass indicated this spot to have been the bottom of some lake or marsh.*

On my return, this evening, I had scarcely sighted the ship, when I discovered that the 'Hamilton' and a tent had returned: at first I feared disaster, but it turned out to be the return of Dr. Lyall. Lieutenant Osborn,

* Through the kindness of Sir W. J. Hooker and his son, Dr. Hooker, I am enabled to furnish the following interesting remarks, which I think better placed here than in the Second Volume:—

"The piece of wood brought by Sir Edward Belcher from the shores of Wellington Channel belongs to a species of Pine, probably to the *Pinus (Abies) alba*, the most northern Conifer. This, the "White Spruce," advances as far north as the 68th parallel, and must be often floated down the great rivers of North America to the Polar Ocean.

"The structure of the wood of the specimen brought home differs remarkably in its anatomical characters from that of any other Conifer with which I am acquainted. Each concentric ring of wood (or annual growth) consists of two zones of tissue; one, the outer, that towards the circumference, is broader, of a pale colour, and consists of ordinary tubes or fibres of wood, marked with the circular discs common to all *Coniferæ*. These discs are usually opposite one another, when more than one row of them occur, in the direction of the length of the fibre, and, what is very unusual, present radiating lines from the central depression to the circumference.

"Second, the inner zone of each annual ring of wood is narrower, of a dark colour, and formed of more slender woody fires, with thicker walls in proportion to their diameter. These tubes have few or no discs upon them, but are covered with spiral striæ, giving the appearance of each tube being formed of a twisted band.

"The above characters prevail in all parts of the wood, but are slightly modified in different rings; thus the outer zone is broader in some than in others, the disc-bearing fibres of the outer zone are sometimes faintly marked with spiral striæ, and the spirally-marked fibres of the inner zone sometimes bear discs.

"These appearances suggest the annual recurrence of some special

having been unable to carry out my intentions, had gone on with the sledge only.

September 14.—I had made arrangements this morning for the further collection of the scraps dug up; but the ice made such unmistakable signs of general disturbance, as to render it necessary to clear away a safer position for the ship and tender within the grounded hummocks. The crews of both vessels were immediately at work, cutting docks and clearing away the bay ice, now about nine inches in thickness. During this interval I was surprised by the boatswain bringing to me part of the furniture of a vessel, apparently the runner of a sliding hatch, and painted similarly to our own vessels or of yachts; it was of teak, and I instantly connected it with the former piece found by Mr. Grove, as part of the same vessel. The only reasonable idea which occurred to me (as it evidently did not belong to any Government vessel) was, that it might be part of 'The Mary,' which Commander Pullen had launched in order to visit Port Leopold, and she might have been nipped

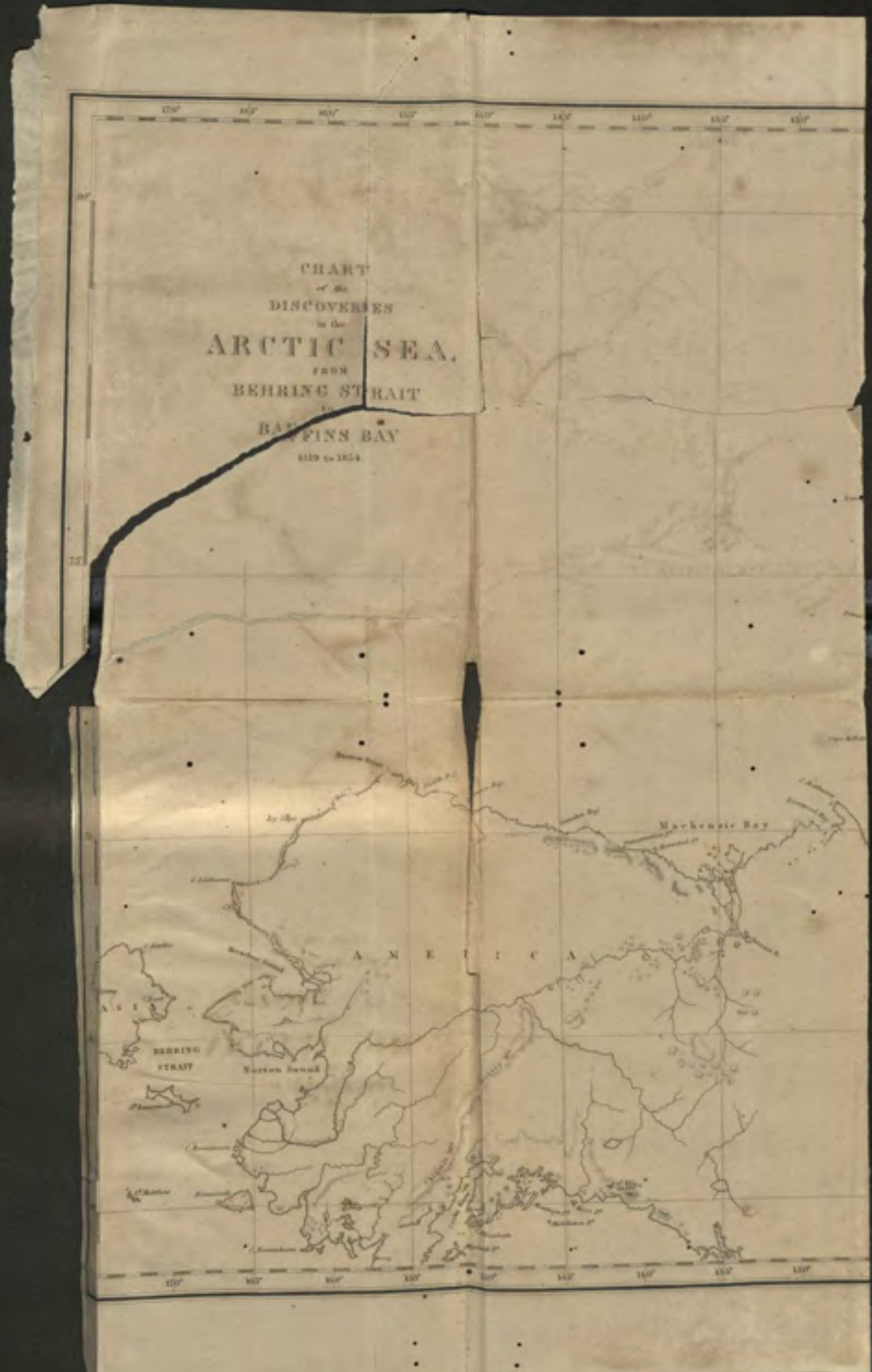
cause that shall thus modify the first and last formed fibres of each year's deposit of wood, so that that first formed may differ in amount as well as in kind from that last formed, and the peculiar conditions of an Arctic climate appear to afford an adequate solution. The inner or first-formed zone must be regarded as imperfectly developed, being deposited at a season when the functions of the plant are very intermittently exercised, and when a few short hours of hot sunshine are daily succeeded by many of extreme cold. As the season advances, the sun's heat and light are continuous during the greater part of the twenty-four hours, and the newly-formed wood-fibres are hence more perfectly developed,—they are much larger, present no signs of striæ, but are studded with discs of a more highly organized structure than are usual in the Natural Order to which this tree belongs."—J. D. Hooker.

in her attempt to reach me. An officer and party was despatched to make further search along the line of hummocks, but without success. About nine P.M. the 'Assistance' was safely secured within the hummocks, but the 'Pioneer' was yet unsafe.

END OF VOLUME I.

JOHN EDWARD TAYLOR, PRINTER,
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Ellesmere Island
Smith Sound
Pendhor Island
North Lincoln
Melville Bay
Melville Island
North Devon
BAFFIN
BAY
Barrow Strait
Lancaster Sound
Melville Sound
Banks Land
Prince Albert Land
Cornhorn Island
Gulf of Boothia
Melville Peninsula
DAVIS
STRAIT
Fox Channel
Southampton Island
Hudson Strait
Labrador


CHART
of the
DISCOVERIES
in the
ARCTIC SEA,
FROM
BEHRING STRAIT
to
BAFFINS BAY
1819 to 1854
Mackenzie Bay
A N E R I C A
BEHRING
STRAIT
Norton Sound


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